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TECHNOLOGY

FOOD TECHNOLOGY ABSTRACTS

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FOOD TECHNOLOGY ABSTRACTS

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ABBREVIATIONS

A	ampere
AAS	atomic absorption Spectrometry
abstr.	abstract
ad lib.	ad libitum
ADP	adenosine diphosphate
Anon.	Anonymous
AOAC	Association of Official Analytical Chemists
approx.	approximately
atm	atmosphere
ATP	adenosine triphosphate
a_w	water activity
BHA	butylated hydroxyanisole
BHT	butylated hydroxytoluene
BOD	biological oxygen demand
b.p.	boiling point
Btu	British thermal unit
c-	centi- [as in cm, cm^2, cm^3]
cal	calorie
cd	candela
Ci	curie
CMC	carboxymethyl cellulose
COD	chemical oxygen demand
coeff.	coefficient
conc.	concentrated
concn.	concentration
cv.	cultivar
cwt	hundredweight
d-	deci-
DE	dextrose equivalent
detn.	determination
DFD	dark firm dry
diam.	diameter
dil.	dilute
DM	dry matter, Deutsche Mark
DNA	deoxyribonucleic acid(s)
dyn	dyne
E.	East, Eastern, etc
ECD.	electron capture detection
EDTA	ethylenediaminetetra acetic acid
Eh	oxidation-reduction potential
ELISA	enzyme-linked immunosorbent assay
f-	femto-[10^{-15}, as in fCi]
°F	degree Fahrenheit
FAO	Food and Agricultural Organization
FDA	Food and Drug Administration
FID	flame ionization detection
fl oz	fluid ounce
f.p.	freezing point
ft	foot, feet
g	gram
GC	gas chromatography
gn	gravity
gal	gallon
gf	gram-force
GLC	gas-liquid chromatography
h	hour
ha	hectare
HDPE	high density polyethylene
hl	hectolitre [100 l]
hp	horse power
HPLC	high performance/pressure liquid chromatography
HTST	high temperature short time
Hz	hertz [frequency cycle/s]
in	inch
IR	infrared
IU	international unit
J	joule
k-	kilo- [as in kcal, kg]
K	Kelvin
l	litre
lb	pound
lb	pound-force
LDPE	low density polyethylene
m-	milli- [as in mg, ml, mm]
m-equiv	milli-equivalent
m	molar concentration
M-	mega- [as in Mrad]
max.	maximum
min	minute [time]
min.	minimum
mol	mole
mol.wt	.molecular weight
m.p.	melting point
MPN	most probable number
MS	mass-spectrometry
n-	nano-[10^{-9}, as in nm]
N	Newton [kg m/s^2]
N.	North, Northern, normal concentration
NMR	nuclear magnetic resonance
NPU	net protein utilization
oz	ounce
p-	pico- [10^{-12}, as in pCi]
P	poise
P	probability
Pa	Pascal [N/m^2]
PAGE	polyacrylamide gel electrophoresis
PER	protein efficiency ratio
p.p.b.	parts per billion
p.p.m.	parts per million
PSE	pale soft exudative
PTFE	polytetrafluorethylene
PVC	polyvinyl chloride
PVDC	polyvinylidene chloride
qt	quart
R	rontgen
rad	rad or radian
ref.	reference(s)
rev/min	revolutions per minute
RH	relative humidity
RNA	ribonucleic acid(s)
S.	south, Southern, etc.
s.d.	standard deviation
SDS	sodium dedecylsulphat
s.e.	standard error
s	second [time]
SNF	solids-not-fat
sp.,spp.	species
sp.gr.	specific gravity
summ.	summary
Suppl.	Supplement
t	metric tonne
temp.	temperature
TLC	thin layer chromatography
TS	total solids
UHT	ultra-high temperature
UV	ultraviolet
V	volt
var.	variety
vol.	volume
v/v	volume/volume
w	watt
W.	West,Western,etc.
WHO	World Health Organization
w/v	weight/volume
wk	week
wt.	weight
yd	yard
yr	year
µ	micro-[as in g, m]
%:	per centum
>	greater than
≥	greater than or equal to; not less than
<	less than
≤	less than or equal to; not greater than

Chemical symbols are used for all el

ABBREVIATIONS FOR LANGU

Language of text

Dutch	Nl
French	Fr
German	De
Italian	It
Japanese	Ja
Norwegian	No
spanish	Es
swedish	Sv

JOURNALS SCANNED FOR FTA

ASEAN Food Journal
Acta Alimentaria
Acta Alimentaria Polonica
Activities Report
Advances in Cereal Science and Technology
Advances in Enzymology
Advances in Food and Nutrition Research
Advances in Food Sciences
Advances in Lipid Research
Advances in Meat Research
Agricultural Situation in India
American Scientist
Anales de Bromatologia
Analyst (London)
Andhra Agricultural Journal
Animal Science and Technology
Applied Microbiology and Biotechnology
Applied and Environmental Microbiology
Appropriate Technology
Archivos Latinoamericanos de Nutricion
Arogya
Australian Journal of Dairy Technology
Australian Journal of Plant Physiology
Bangladesh Journal of Scientific and Industrial Research
Beverage and Food World
Bioscience, Biotechnology and Biochemistry
Biotechnology
Biotechnology and Bioengineering
Biotechnology Advances
Biotechnology Letters
Biotechnology Progress
British Journal of Nutrition
Bulletin of Entomological Research
Bulletin of Grain Technology
Bulletin of Sciences
CRC Critical Reviews in Biotechnology
CRC Critical Reviews in Food Science and Nutrition
CRC Critical Reviews in Microbiology
CRC Critical Reviews in Toxicology
CSIRO Food Research Quarterly
Cafe-Cocoa-The
Canadian Journal of Animal Science
Cereal Chemistry
Cereal Foods World
Chemical Senses
Chemistry and Industry
Coffee & Cocoa International
Confectionery Production
Cuban Journal of Agricultural Science
Current Science
Dairy and Food Sanitation
Defence Science Journal
Deutsche Lebensmittel-Rundschau
Developments in Dairy Chemistry
Developments in Food Analysis Techniques
Developments in Food Colours
Developments in Food Microbiology
Developments in Food Preservation
Developments in Food Proteins
Developments in Food Science
Developments in Industrial Microbiology
Developments in Meat Science
Developments in Soft Drink Technology
Developments in Sweeteners
Die Nahrung
Economic Botany
Enzyme and Microbial Technology
Ernahrungsforschung
FAT Science Technology
Fishery Technology
Flour Milling and Baking Research Association Bulletin
Food
Food Additives and Contaminants
Food Australia
Food Biotechnology
Food Chemistry
Food Engineering
Food Engineering International
Food Hydrocolloids
Food Manufacture
Food Microbiology
Food Microstructure
Food Processing
Food Production/Management
Food Reviews International
Food Science and Technology Today
Food Technology
Food Technology in New Zealand
Food Trade Review
Food and Chemical Toxicology
Food and Cookery Review
Food and Nutrition Bulletin
Food from Poland
Food in Canada
Food Research International
Fruits
Getreide-Mehl und Brot
Gordian
Grasas y Aceites
Hortscience
Indian Arecanut, Spices and Cocoa Journal
Indian Baker
Indian Cashew Journal
Indian Coconut Journal
Indian Coffee
Indian Dairyman
Indian Farming
Indian Food Industry
Indian Food Packer
Indian Horticulture
Indian Journal of Agricultural Economics
Indian Journal of Agricultural Sciences
Indian Journal of Animal Research
Indian Journal of Animal Science
Indian Journal of Biochemistry and Biophysics
Indian Journal of Dairy Science
Indian Journal of Environmental Health
Indian Journal of Experimental Biology
Indian Journal of Fisheries
Indian Journal of Horticulture
Indian Journal of Medical Research
Indian Journal of Medical Sciences

Indian Journal of Microbiology
Indian Journal of Nutrition and Dietetics
Indian Journal of Poultry Science
Indian Journal of Public Health
Indian Journal of Technology
Indian Miller
Indian Perfumer
Indian Spices
Indian Sugar
Industria Conserve
Industrie Alimentari
Industries Agro-Alimentaires
Industries Alimentaires et Agricoles
INFORM
Insect Biochemistry
International Bottler and Packer
International Fruit World
International Journal for Vitamin and Nutrition Research
International Journal of Animal Sciences
International Journal of Food Microbiology
International Journal of Food Science and Technology
International Journal of Food Sciences and Nutrition
International Journal of Refrigeration
International Pest Control
International Rice Research Newsletter
Invention Intelligence
Irish Journal of Food Science and Technology
Italian Journal of Food Science
JARQ (Japan Agricultural Research Quarterly)
Japan Pesticide Information
Journal of Agricultural and Food Chemistry
Journal of Animal Science
Journal of AOAC International
Journal of Biosciences
Journal of Cereal Science
Journal of Chemical Technology and Biotechnology
Journal of Coffee Research
Journal of Dairy Research
Journal of Dairy Science
Journal of Economic Entomology
Journal of Fermentation and Biotechnology
Journal of Food Biochemistry
Journal of Food Engineering
Journal of Food Process Engineering
Journal of Food Processing Preservation
Journal of Food Protection
Journal of Food Quality
Journal of Food Safety
Journal of Food Science
Journal of Food Science and Technology (India)
Journal of General Microbiology
Journal of General and Applied Microbiology
Journal of Horticultural Science
Journal of Industrial Microbiology
Journal of Insect Physiology
Journal of Japanese Society for Food Science and Technology
Journal of Lipid Research
Journal of Nutrition
Journal of Nutritional Biochemistry
Journal of Nutritional Science and Vitaminology
Journal of Plantation Crops
Journal of Root Crops
Journal of Scientific and Industrial Research
Journal of Sensory Studies
Journal of Stored Products Research
Journal of Texture Studies
Journal of the American Oil Chemist's Society
Journal of the American Society for Horticultural Science
Journal of the Indian Chemical Society
Journal of the Institute of Brewing
Journal of the Institution of Chemist's (India)
Journal of the Japanese Society of Starch Science
Journal of the National Science Council of Sri Lanka
Journal of the Oil Technologists Association of India
Journal of the Science of Food and Agriculture
Journal of the Society of Dairy Technology
Kenya Coffee
Khadigramodyog
Lebensmittel-Wissenschaft und - Technologie
Lipids
Lipid Technology
Madras Agricultural Journal
Manufacturing Confectioner
Meat Science
Milling & Baking News
Milling Feed and Fertiliser
Mushroom Journal
Nature, UK
Netherlands Journal of Agricultural Sciences
Netherlands Milk and Dairy Journal
New Scientist
New York's Food and Life Sciences
Nutrition Reviews
Oils and Oilseeds Journal
Oryza
Packaging
Packaging India
Packaging Japan
Packaging Week
Paperboard Packaging
Perfumer and Flavourist
Pesticide Biochemistry and Physiology
Pesticide Science
Pesticides Information
Pest Technology
Phillippine Journal of Food Science Technology
Phytochemistry
PKV Research Journal
Plant Physiology
Plant Science
PORIM Bulletin
Poultry Guide
Poultry Science
Prepared Foods
Proceedings of the All India Sugar Technologists
Proceedings of the Indian Academy of Science, Section A
Proceedings of the Indian Academy of Science, Section B
Proceedings of the Nutrition Society of India
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Research and Industry, India
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Standards India
Starch/Starke
Tea and Coffee Trade Journal
Technical Quarterly, Master Brewers Association of America
Technology Review
Toxicology
Trends in Food Science and Technology
Tropical Agriculture
Tropical Pest Management
Tropical Science
Two and a bud
VarFoda
Voeding
World Coffee and Tea
World's Poultry Science Journal
Zeitschrift Fuer Lebensmittel-Untersch und Forschung

GENERAL

1

Berry (SK). **Role of air in foods.** *Indian Food Industry* 11(2): 1992: 40-46

The functional role of air in selected food products (cereal-based food products, legume-based food products, sugar-based products, milk and fat-based products, egg products, meat products and puffed products) offered either as emulsion or foam prepared using traditional and modern processing techniques is highlighted. The production data and the nutritive value of some of the food products is also presented. CSA

2

Hildebrand (DF). **Altering fatty acid metabolism in plants.** *Food Technology* 46(4): 1992: 71-74

The progress and prospects of using biotechnology for improving fatty acid composition and the formation of fatty acid peroxidation products in plant-derived food components is reviewed in this article. 27 references. CSA

FOOD PROCESSING

3

Olszyna-Marzys (AE). **Radioactivity and food preservation.** *Nutrition Reviews* 50(6): 1992: 162-165

The purpose, advantages, limitations had different methods of food irradiation: the types of foods that are benefitted by radioactive preservation: and the possible toxic side-effects are discussed in the paper. GS

FOOD PACKAGING

4

Fuchs (M), Kluge (S), Ruter (M), Wolff (E) and Piringer (O). **Global migration determination and sensory evaluation of microwaveable material coming into contact with food (Part II).** *Deutsche Lebensmittel-Rundschau* 87(10): 1991: 311-316 (De)

During preparation and heating of food in microwave ovens temp. up to 150°C - also in the absence of susceptors - can occur dependent on the time of treatment, structure and fat content of food. Usually, the temp. hardly exceed 100°C. To evaluate the quality of packages and containers for microwave use with regard to the overall migration, the total amount of substance transferred to the food simulant Tenax was determined by extraction with diethyl-ether and subsequent GC analysis of the extract and, in some cases, gravimetrically after evaporation of the solvent. The amount of transferred compounds obtained in this way was dependent on the type of plastic. Whereas, for plastics on the base of polyester and polysulphon, mass transfer was found to be mostly in the range of the detection limit of 0.1 mg/dm^2, the corresponding values for polypropylene were found to be remarkably higher. The method described here allows a rapid and economic examination of packages and containers at higher temp. Possible sources of faults are taken into consideration and discussed. In principle, the method allows the identification of the migrated substances using suitable detectors. The results of the sensory evaluation indicated to some extent, but not a general correlation with the desorbed amounts. Furthermore, in contrast to the physical examinations, the sensory evaluation did not provide such a clear distinction between the different types of plastic. AA

5

Madhwaraj (MS), Satish (HS), Vijayendrarao (AR) and Mahendrapandian (S). **Filling of retort pouch - a simple device to obtain clean seal area.** *Indian Food Industry* 11(2): 1992: 47-48

Describes a simple technique to eliminate contamination of seal area in flexible pouches due to spurting and accumulated drip as delivery nozzle comes in contact with the inner surface of the pouches while withdrawing. CSA

6

Grob (K), Artho (A), Biedermann (M), Caramaschi (A) and Mikle (H). **Batching oils on sisal bags used for packaging foods: Analysis of coupled LC/GC.** *Journal of AOAC International* 75(2): 1992: 283-287

Sisal fibres are treated with a batching oil before spinning. Such oils usually consist of mineral oil products and cause considerable contamination of the packed foods (typically 10 - 100 mg/kg). Batching oils recovered from sisal bags previously used for transporting cocoa and coffee beans were analyzed for total concn. on the bag as well as the composition of the paraffins and aromatics. Concn. of total hydrocarbons ranged between 0.3 and 39 g/kg sisal bag; concn. of aromatics ranged between < 0.1 and 2.7 g/kg. The applied batching oils varied between raw mineral oil fractions, somewhat purified fractions, and a crystallized product. AA

Packaging materials

7

Trivedi (MK). **Speciality papers for packaging.** *Packaging India* 25(1): 1992; 5, 7, 9, 11

A brief discussion on some important papers used in packaging (tissue papers, printing paper, high gloss papers, cover papers, glassine and greaseproof papers, waxed papers, water proof papers, parchment paper, functional papers, wet strength paper, mould resistant papers, vapour phase inhibitor papers and laminations) and the principles involved in making them are dealt in this article. CSA

8

Vinh (PQ), Alur (MD) and Nair (PM). **γ-radiation induced physical changes in Vietnam and Indian packaging materials.** *Packaging India* 25(1): 1992; 13-16

Physical properties such as force required to break (Newton) and elongation (%) of Vietnam and Indian packaging materials subjected to γ-radiation are compared. The results indicated that polyethylene pouches made in Vietanam were found to have a weak structure breaking with a force of 20N while Indian polyethylene of different guages (560, 620 and 680) were quite strong requiring force not less than 30 - 40N. Irradiation improved certain physical parameters of Indian packaging material while Vietnam polyethylene showed loss of tensile property due to γ-radiation. However, Vietnam laminated paper polyethylene showed no change after irradiation suggesting its suitability for γ-ray sterilization which could be used to prevent contamination of flesh foods which required doses < 5 kGy. AA

FOOD ENGINEERING AND EQUIPMENT

9

Kachru (RP) and Singh (HP). **Drying of agricultural products for minimizing post-harvest losses.** *Indian Farming* 42(1): 1992; 29-32

Rice and soybean harvested at 20 - 25% (wb) moisture need to be dried to 10-12% (wb) for safe storage. Economic analysis of some selected crop driers for paddy, pearl millet, sorghum, groundnut, copra, coconut, black pepper, arecanut, cardamom, cocoa beans, wheat, shelled maize, pulses, pigeon pea, fish, papads is presented. SD

10

Krishnappa (KG) and Krishnaiah (MM). **Pollution and control in roller flour milling industry.** *Indian Miller* 22(5): 1992; 15-18

Aspects covered in this article are: dust pollution, water pollution, water pollution treatments in roller flour mill and noise pollution (measurement of noise level, sources of noise in roller flour mill, noise control in roller flour milling, reduction of noise level in the mill). SRA

11

Ramesh (A). **Food processing plant and machinery - an overview.** *Indian Food Industry* 11(1): 1992; 20-26

An overview of the design of the food processing plant and machinery, the machinery needs of the food industry in India, special developments needed in some technology areas which include high speed specialised centrifugal separators; large capacity spray-drying and roller-drying plants; evaporation and aroma recovery plants; specialised energy efficient heat exchangers; aseptic processing and packaging equipment; special types of forming and cooking machinery; equipment based on emerging techniques like supercritical fluid extraction, cryogenics and membrane processing; latest types of freezing and freeze-drying equipment and system designs and a list of important machinery required for selected food processing industries is presented. CSA

12

Richardson (PS). **Product design for microwave reheating.** *Indian Food Industry* 11(2): 1992; 24-32

Electro-magnetic spectrum and fundamentals of microwave heating, energy distribution and its effect on temp. distribution in products, product design (component selection, product interactions, packaging considerations, performance testing, product test, production consideration) are described in this article. A case study to identify the effects of food component layout and packaging material (foil versus plastic) on the reheating characteristics of a standard, experimental, frozen ready-meal consisting of ground beef (130 g), processed peas (80 g) and mashed potato (102 g) was conducted. The results show that foil trays can be used successfully to achieve even heating and that for best results the heating rates of the components need to be matched. CSA

Equipments

13

Schmidt (A). **Technical equipment for the intake of high quality grain.** *Getreide-Mehl und Brot* 45(9): 1991: 263-265 (De)

14

Jagadeesh (A). **Solar water pre-heater for cooking.** *Invention Intelligence* 28(3): 1992: 68-69

Design, operation and performance of a simple solar water pre-heater (Jagadeeshwar-II) for cooking is described. The pre-heated water using solar energy saves cooking fuel in rural areas and to many other applications, including hot water supply. BV

ENERGY IN FOOD PROCESSING

Nil

FOOD CHEMISTRY AND ANALYSIS

Chemistry

15

Bradley (DG) and Min (DB). **Singlet oxygen oxidation of foods.** *CRC Critical Reviews in Food Science and Nutrition* 31(3): 1992: 211-236

This article reviews the basic information on the chemical properties, formation, and inhibition and detection of singlet oxygen oxidation as it relates to the oxidation of vegetable oils, dairy products and meats and other food components. Covers electron configuration of molecular oxygen, mechanism of photosensitized oxidation, effects of packaging materials on foods during light exposure, the role of singlet oxygen in oxidation in food, detn. of quenching mechanisms of singlet oxygen oxidation. 168 references. SRA

16

Whitfield (FB). **Volatiles from interactions of Maillard reactions and lipids.** *CRC Critical Reviews in Food Science and Nutrition* 31(1/2): 1992: 1-58

This article provides current information on the production of volatile compounds from interactions of Maillard reactions and lipids. It includes the Maillard reactions, the strecker degradation of amino acids and the oxidation of lipids. Compounds derived from these reactions that could interact to form volatile flaalvour components during the processing or cooking of food is highlighted. Results from model systems involving interactions between Maillard reaction products and carbonyl compounds, amino acids and carbonyl compounds, amino acids and derivatives of fatty acids, and Maillard reaction products, triglycerides and phospholipids are discussed. The qualitative and quantitative effects of triglycerides and phospholipids on the formation of volatile Maillard products having long-chain alkyl heterocyclic compounds, methods for their formation, their aromas, the role of these compounds in cooked foods (meat and beverages) are also covered. 117 references. SRA

17

Cairns (T) and Siegmund (EG). **Confirmation of trace level residues in the food supply.** *CRC Critical Reviews in Food Science and Nutrition* 30(4): 1991: 397-402

The emphasis of this review is on the experimental process of confirmation at concn. levels in the range of p.p.m. to p.p.t. At such levels, various data manipulations or alternate choices of approaching the analytical problem of confirmation must be employed to ensure an acceptable result. The problems experienced when dealing with nanogram levels in analysis are much more complex than when recording mass spectrum of an ample supply of a reference standard. An interpretation of the developing status of the confirmation since there does not yet exist "accepted criteria". 10 references. SRA

18

Chauhan (GS), Eskin (NAM) and Tkachuk (R). **Nutrients and antinutrients in quinoa seed.** *Cereal Chemistry* 69(1): 1992: 85-88

Quinoa seeds, manually and water dehulled, were ground into meal and milled into bran and flour. The protein content of the whole seed was 13.7%, with bran, flour, and hulls accounting for 65, 28 - 30, and 7% of the total protein, respectively. Seeds prepared by manual dehulling were all higher in lysine and sulphur amino acids, which are typical of legumes and cereals. Mineral analysis showed that quinoa seed fractions were all rich in Ca, P and Fe. Examination of antinutrients indicated very little trypsin inhibitor activity. The saponin content was quite low in the quinoa var. examined, with 34% located in the hulls. Although manual dehulling reduced the saponin content, a further reduction in saponin was obtained by water extraction. AA

19

Gromes (R), Glaser (D), Sattig (B) and Schnellbacher (B). **Determination of nitrate levels in foodstuffs using HPLC and a new enzymatic assay.** *Deutsche Lebensmittel-Rundschau* 87(11): 1991: 346-350 (De)

The nitrate levels in different foodstuffs were investigated with 2 methods. The results obtained with nitrate standard solutions from HPLC and the enzymatic method were comparable. After the same sample preparation nitrate was determined in wine, juices, vegetables and herbs. In the range of 5 - 80 mg/l nitrate the results obtained with both methods were reproducible and comparable. Below 5 mg/l nitrate the enzymatic method lead to better reproducible results. AA

20

Seifert (A), Strenge (K), Schultz (M) and Schmandke (H). **Determination of stability of food emulsions. Part 1. The influence of the type and concentration of protein on creaming stability determined by analytical ultracentrifugation.** *Die Nahrung* 35(9): 1991: 989-998

21

Lanher (BS). **Quantitative analysis of agricultural and food products: A new instrumental and computerized approach.** *Journal of AOAC International* 75(1): 1992: 18-25

A new software package, ANAQUANT, was specifically designed for a long-term approach to the quantitation of compounds in biological products. Its functionality and validity were tested by measuring fat and protein contents in liquid cow's milk using Fourier transform infrared spectrometry and a handcrafted transmission flow cell. Calibration and validation standard deviations were 0.2484 and 0.3987 g/kg, respectively, for the prediction of proteins, and 0.3163 and 0.4222 g/L, respectively, for the prediction of butterfat. One month elapsed between calibration of the instrument and the validation study. Results are consistent with those proposed in the literature. AA

22

Ulberth (F) and Henninger (M). **One-step extraction/methylation method for determining the fatty acid composition of processed foods.** *Journal of the American Oil Chemist's Society* 69(2): 1992: 174-177

In a one-step extraction/methylation (OSM) method for determining individual fatty acids (FA) in processed food products, freeze-dried samples, containing 10-50 mg fat, were transmethylated without prior fat extraction with a mixture of methanol-HCl/toluene. After washing the organic phase the formed FA methyl esters were ready for separation by gas-liquid chromatography (GLC). The relative standard deviation for total FA content was < 3.5%, regardless of the food type analyzed. Furthermore, the FA composition of selected fatty foods as obtained by the OSM procedure was almost identical with the FA composition of the pure fats extracted by the Soxhlet procedure and with chloroform-methanol, respectively. The OSM method is inexpensive and simple to perform and is, therefore, well suited for nutrient labeling studies, especially in situations where many samples have to be analyzed for their total FA content. AA

23

Miller-Ihli (NJ) and Greene (FE). **Graphite furnace atomic absorption method for the determination of chromium in foods and biological materials.** *Journal of AOAC International* 75(2): 1992: 345-359

A method was developed for the detn. of chromium in food samples and other biological materials. Samples are dry ashed in a muffle furnace and are analyzed by graphite furnace atomic absorption spectrometry. Magnesium nitrate is used as a matrix modifier, and samples are quantitated by platform atomization and peak area measurements with direct calibration against aqueous standards. The detection limit (based on 3.29 σ) was 5.6 pg, or 0.28 μg/L for a 20 μL injection. The characteristic mass was 3.2 pg. This method was validated by analyzing a range of reference materials and was subsequently used for the analysis of a var. of food samples. A comparison of analytical results obtained from direct calibration and method of additions was made. AA

24

Prosky (L), Asp (N-G), Schweizer (TF), DeVries (JW) and Furda (I). **Determination of insoluble and soluble dietary fiber in foods and food products: Collaborative study.** *Journal of AOAC International* 75(2): 1992: 360-367

25

Li (BW) and Cardozo (MS). **Nonenzymatic-gravimetric determination of total dietary fiber in fruits and vegetables.** *Journal of AOAC International* 75(2): 1992: 372-374

Most gravimetric methods for total dietary fiber (TDF) detn. require the complete removal of starch and the partial removal of protein with various combination of enzymes in buffers at different pH values and at temp. much above ambient condition. A hydrolysis step is crucial in dietary fiber analysis

of samples, such as cereals and legumes, which contain appreciable amounts of starch. However, many vegetables and most fruits contain very little or no starch, and they are often eaten uncooked. It would be unnecessary to use high temp. and enzymes on these types of samples. Initially, it was found that hexane and dilute alcohol extractions of a few selected fruits and vegetables gave residue wts. comparable to those after enzymatic treatments. It was able to show later that simply suspending the samples in deionized water for 90 min at 37°C and then adding 95% ethanol also yields TDF values similar to those obtained from other published methods. Comparison data obtained by using variations of the AOAC/TDF method are presented for 10 fruits and vegetables. AA

26

Abdel-Kader (ZM). **Comparison of AOAC and high-performance liquid chromatographic methods for thiamin determination in foods.** *Food Chemistry* 43(5): 1992: 393-397

Thiamin determined by a rapid, sensitive, accurate and economical HPLC assay in whole milk, skim milk powder, Cheddar cheese, raw pea, boiled potatoes, enriched wheat flour, noodles, rice, corn flake and orange compared well with the AOAC method. SD

27

Kemsley (EK), Zhuo (L), Hammouri (MK) and Wilson (RH). **Quantitative analysis of sugar solutions using infrared spectroscopy.** *Food Chemistry* 44(4): 1992: 299-304

Fourier Transform Infrared spectroscopy in the mid-infrared (4000 - 400 cm^{-1}) showed potential for on-line monitoring being rapid. The calibrations for mixtures of sucrose, glucose and fructose obtained by matrix methods, were applied to real and synthetic samples and compared with those obtained from traditional methods. SD

28

Razagui (IB) and Barlow (PJ). **A chemical clean-up procedure to reduce trace metal contamination from laboratory blenders.** *Food Chemistry* 44(4): 1992: 309-312

A simple and economical method is described for minimising adventitious contamination from lab. blender prior to their use for the homogenisation of food samples that are to be analysed for mineral content. The blenders are treated with a hot aqueous solution of a mixture of 2% EDTA and 2% citric acid. The solution is allowed to mix in the blender at medium speed for 5 min before the bowls of the blenders are rinsed and the treatment repeated for a second time. The clean-up procedure minimises contamination for Fe, Zn, Cu, Pb, Cd and Cr. SD

29

Wada (E), Mizutani (H) and Minagawa (M). **The use of stable isotopes for food web analysis.** *CRC Critical Reviews in Food Science and Nutrition* 30(4): 1991: 361-371

The use of stable isotope ratio patterns of nitrogen and carbon to study food webs of a variety of ecosystems, such as estuaries, the Antarctic ocean, seabird rookeries, and humans is demonstrated in this article. Examples of the fluctuations of these elemental isotope ratios are reviewed in light of underlying food habits of the ecosystem's inhabitants. The results demonstrate the overall usefulness of the stable isotope approach to food web analysis. 17 references. SRA

FOOD MICROBIOLOGY AND HYGIENE

30

Garcia de Fernando (GD), Diaz (O), Fernandez (M) and Ordonez (JA). **Changes in water activity of selected solid culture media throughout incubation.** *Food Microbiology* 9(1): 1992: 77-82

The a_w of selected culture media commonly used in food microbiology have been determined and the effects of the vol. of medium poured in Petri dishes, temp. and time of incubation on a_w reduction studied. The a_w values consistently fell throughout incubation. However, in culture media with a_w > 0.94, the reduction of a_w was negligible for microbial growth at incubation temp. < 32°C. Nevertheless, the a_w reductions at higher temp. may retard microbial growth. In media with a_w between 0.83 and 0.94, the a_w decreased sufficiently to adversely affect the growth of microorganisms on these media. The relationships between the a_w of the media and microbial growth on them are discussed. AA

31

Jay (JM). **Microbiological food safety.** *CRC Critical Reviews in Food Science and Nutrition* 31(3): 1992: 177-190

The present state of our knowledge of foodborne pathogens, including the incidence of foodborne diseases, the factors that contribute to them, the newer processing technologies and the potential they present relative to foodborne illnesses are reviewed in this article. Other aspects covered are the approaches to food safety taken by the food

industry, hard data are cited where they exist along with sources. 24 references. SRA

Enzymes

32

Abraham (TE), Jamuna (R), Bansilal (CV) and Ramakrishna (SV). **Continuous synthesis of glucoamylase by immobilized fungal mycelium of *Aspergillus niger*.** *Starch/Starke* 43(3): 1991: 113-116

The extracellular glucoamylase enzyme (EC 3.2.1.3) was synthesized continuously by the immobilized mycelial fragments of *A. niger*. Of the several polymeric matrices attempted for immobilization k-carrageenan and alginate were found to be the most effective. However, the enzyme activity exhibited by the immobilized mycelia (I.M.) was 15-20% lower than that of free cells under batch conditions. The immobilized cells have retained nearly the same enzymatic activity (120IU/g) of I.M.) for 6 repeated batches and thereafter decline in activity was noticed. An aerated packed bed reactor with I.M. was operated continuously for 360 h. The volumetric productivity of the reactor was 1600IU/L/h for 192 h and reduced to 25% in 360 h. AA

Microorganisms

Bacteria

33

Doyle (MP). **A new generation of foodborne pathogens.** *Dairy, Food and Environmental Sanitation* 12(8): 1992: 490, 492-493

This review focusses pathogens (*Campylobacter jejuni, Yersinia enterocolitica, Vibrio vulnificus, Listeria monocytogenes, Enterohemorrhagic Escherichia coli* 0157:H7, *Salmonella enteritidis*) that recently have been recognized as important causes of foodborne disease. 22 references. SRA

Aeromonas

34

Gram (L). **Inhibition of mesophilic spoilage *Aeromonas* spp. on fish by salt, potassium sorbate, liquid smoke, and chilling.** *Journal of Food Protection* 54(6): 1991: 436-442

The purpose of the present study has been to develop simple fish preservation techniques applicable at artisanal level in developing countries in the tropical zone. Mesophilic motile *Aeromonas* spp. which were classified as specific spoilage bacteria of Nile perch (*Lates niloticus*) from Lake Victoria stored at ambient temp. were inhibited in lab. model systems using NaCl, potassium sorbate, and liquid smoke. Growth was not detected when the salt concn. exceeded 5% or the temp. was below 5°C. At 25 - 37°C growth occurred within 24 h when no preservation was applied, but a combination of 5% salt and 1000 p.p.m. sorbate inhibited growth at 25 - 37°C. Liquid smoke inhibited growth at 37°C only when an initial low inoculum (10^2 CFU/ml) was used. Based on the model exp., trials were carried out in Kenya and a lightly preserved fish product stable at ambient temp. was developed. The addition of 1.5% salt (w/w) and 1500 p.p.m. sorbate (w/w) followed by 3 days of sun-drying resulted in a lightly brown, well preserved fish product which could be produced at artisanal level and was palatable to local consumers. Good agreement was seen between results from model exp. and trials with fish. AA

Aeromonas hydrophila

35

Palumbo (SA), Williams (AC), Buchanan (RL) and Phillips (JG). **Model for the aerobic growth of *Aeromonas hydrophila* K144.** *Journal of Food Protection* 54(6): 1991: 429-435

The combined effects of temp. (5 and 42°C), NaCl (0.5 to 4.5%), pH (5.3 to 7.3), $NaNO_2$ (0 to 200 µg/ml) on the aerobic growth of *aeromonas hydrophila* K144 were studied in brain heart infusion (BHI) broth using a modified central composite design. Variable combinations were tested in triplicate aerobic flasks; viable cell counts were made at intervals during incubation by surface plating on tryptic soy agar. Growth curves were generated using the Gompertz equation in conjunction with a nonlinear iterative regression analysis. Values for the 4 Gompertz parameters (A, C, B and M) were obtained for the variable combinations tested. Using response surface techniques, quadratic and cubic equations containing the 4 variables of temp., pH, NaCl, and $NaNO_2$ were developed to yield predictive values for the B and M Gompertz values. Goodness of fit evaluation of the models was by R^2 values. Comparison of predicted and observed values of B and M and evaluation of predicted lag times and generation times indicated that the quadratic model gave a better fit. Overall, the variable combinations interacted to decrease the generation time and increase the lag time. The results indicate that pH, salt and nitrite can decrease the growth of *A. hydrophila* when combined with low temp. incubation. AA

Bacillus

36

Jamuna (R), Bindu (C) and Ramakrishna (SV). **Synthesis of thermostable α-amylase by *Bacillus* isolate R-8.** *Starch/Starke* 43(1): 1991: 28-32

An indigenous isolate *Bacillus* R-8 was found to produce thermostable α-amylase. The enzyme yield was highest during the stationery phase of the culture. Max. production of 100 units per ml was achieved in the maltose medium and also in the alkaline conditions of fermentation. It has been observed that the rate of enzyme formation was highest (2.8 units/g of cells/h) with glucose under neutral conditions. The variations in the fermentation parameters which have resulted in the significant difference in terms of total enzyme production and the rate of enzyme formation have been discussed. AA

Leuconostoc oenos

37

Krieger (SA), Hammes (WP) and Henick-Kling (T). **Effect of medium composition on growth rate, growth yield and malolactic activity of *Leuconostoc oenos* LoZH$_1$-t$_7$-1.** *Food Microbiology* 9(1): 1992: 1-11

A new synthetic medium (pH 4.5) for the preparation of starter cultures and to quantify the effect of various amounts of glucose, fructose and malate on growth rate, cell yield, and malolactic activity of a selected strain of *Leuconostoc oenos* was studied. All cultures were incubated at 25°C. Samples were drawn at every 12 h over 4 days. The number of viable cells was determined at 72 or 96 h. Results indicated that the growth rate and yield were highest in media containing fructose as carbohydrate source. Max. cell density was reached in media containing fructose after 36 h, compared to 144 h in media containing glucose. Cell yields in fructose media were 160 - 200% higher than glucose media. Molar growth yield was the same for glucose and fructose and with and without L-malate. Results revealed that, best growth rate, cell yield and malolactic activity could be obtained in fructose media as main carbohydrate source with added glucose and L-malate. SRA

Listeria monocytogenes

38

Rossen (L), Holmstrom (K), Olsen (JE) and Rasmussen (OF). **A rapid polymerase chain reaction (PCR)-based assay for the identification of *Listeria monocytogenes* in food samples.** *International Journal of Food Microbiology* 14(2): 1991: 145-152

A rapid and simple assay has been developed which allows specific detection of *L. monocytogenes* within 3.5 h in cultures prepared from suspect food samples and propagated 48 h in selective medium. The assay is based on PCR technology, and uses a specific primer set derived from sequences located down-stream of the *hlyA* gene. The specificity of the primer set was confirmed by testing 115 *L. monocytogenes*, 14 *L. innocua*, 5 *L. seeligeri* and 4 *L. ivanovii* isolates. The assay was compared to standard microbiological tests and gave identical results for 83 food samples, including 32 positives. These field trials indicate that the assay developed provides an alternative detection system for *L. monocytogenes* in foods, which can be used by the food industry. AA

39

Westoo (A) and Peterz (M). **Evaluation of methods for detection of *Listeria monocytogenes* in foods: NMKL collaborative study.** *Journal of AOAC International* 75(1): 1992: 46-52

Blue and white mold cheese and canned corned beef, were inoculated with 3 levels of *L. monocytogenes*. Beef was also inoculated with a microbial flora derived from raw meat. The recoveries of *l. monocytogenes* using USDA method, Food safety and inspection service method for dairy products did not differ significantly. The Oxford agar was superior to the lithium chloride phenylethanol-moxalactam agar. KOH treatment of the enriched culture did not significantly increase the detection rate of the organism. For cheese the detection level of the methods was below 0.2 cfu *L. monocytogenes*/g, and for meat, the detection level was below 5 cfu *L. monocytogenes*/g. BV

40

Saguy (I). **Simulated growth of *Listeria moonocytogenes* in refrigerated foods stored at variable temperatures.** *Food Technology* 46(3): 1992: 69-71

The objective of this study was to simulate mathematically serveral possible distribution and storage scenarios and to assess the potential growth of *Listeria monocytogenes* in refrigerated minimally processed foods. The results of the study demonstrate the necessity of controlling storage temp. of ready-to-eat minimally processed foods throughout the product life cycle from production to actual consumption, the need for appropriate Hazard Analysis Critical Control Point and microbial inhibitor factors to guarantee product safety when temp. fluctuations are expected. CSA

Shigella flexneri

41

Zaika (LL), Kim (AH) and Ford (L). **Effect of sodium nitrite on growth of *Shigella flexneri*.** *Journal of Food Protection* 54(6): 1991: 424-428

A partial factorial design study of the effect of $NaNo_2$ (0, 100, 200, 1000 p.p.m.) in combination with NaCl (0.5, 2.5, 4.0%), pH (7.5, 6.5, 5.5), and temp. (37, 28, 19°C) on growth of *Shigella flexneri* is reported. Exp. were done aerobically in brain-heart infusion medium, using an inoculum of 1×10^3 CFU/ml. Growth curves were fitted from plate count data by the Gompertz equation; exponential growth rates, lag times, generation times, and max. populations were derived for all variable combinations. In the absence of nitrite, the organism grew well under all test conditions at 37 and 28°C but did not grow at 19°C at pH 5.5 nor at pH 7.5 with 4% NaCl. Nitrite did not affect growth in media of pH 7.5 at 37 and 28°C. At pH 6.5 growth was inhibited by 1000 p.p.m. $NaNO_2$. The organism failed to grow at 19°C at all nitrite levels in the presence of 2.5 or 4.0% NaCl. The inhibitory effect of nitrite was much greater in media of pH 5.5 and increased with increasing salt levels. More inhibition was apparent at 28 than at 37°C. While lack of growth was used as a paradigm of the effect of nitrite on *S. flexneri*, nitrite also increased the lag and generation times and decreased the exponential growth rate. Results indicated that $NaNO_2$ in combinations with low temp, low pH, and high salt content can effectively inhibit the growth of *S. flexneri* AA

Fungi

42

Beuchat (LR), Nail (BV), Brackett (RE) and Fox (TL). **Comparison of the petrifilm™ yeast and mold culture film method to conventional methods for enumerating yeasts and molds in foods.m** *Journal of Food Protection* 54(6): 1991: 443-447

Petrifilm™ Yeast and Mold (YM) plates were compared to acidified potato dextrose agar (APDA) and chloramphenicol-supplemented plate count agar (CPCA) for its suitability to enumerate yeasts and molds in 13 groups of food products. These products consisted of beans (dry and frozen, green), corn meal, flour (wheat), fruit (apple), a meat/vegetable entree (chicken pot pie), a precooked meat (beef), milk (dehydrated, nonfat), nuts (pecans), pasta, potatoes (dehydrated), precooked sausage, and a spice (black pepper). Correlation coeff. of Petrifilm™ YM plates versus APDA and CPCA pour plates for recovering total yeasts and molds from a composite of the 13 test foods were, respectively, 0.961 and 0.974. Individually, Petrifilm™ YM plate counts were equivalent or higher than APDA and CPCA for some food groups and lower for other food groups. Because food particle interference can make enumeration of yeast and mold colonies on Petrifilm™ YM plates difficult for some food groups, potential food interference will need to be evaluated for each food group tested. AA

Aspergillus

43

Sardjono, Rahayu (K) and Sudarmadji (S). **Growth and aflatoxin production by *Aspergillus flavus* in mixed culture with *Aspergillus oryzae*.** *ASEAN Food Journal* 7(1): 1992: 30-33

Production of aflatoxin by *Asp. flavus* was significantly reduced during mixed culture with *Asp. oryzae*. Aflatoxin B1 present in the spent culture medium of *Asp. flavus* was deactivated by the subsequent growth of *Asp. oryzae*. This study indicates natural control of aflatoxin production or accumulation during soy sauce or kecap fermentation and emphasizes the need for rapid and dominant growth of *Asp. oryzae* during these fermentations. SRA

Yeasts

Saccharomyces cerevisiae

44

Nagarajan (L) and Umesh-Kumar (S). **Antigenic studies on flocculating brewer's yeast, *Saccharomyces cerevisiae* NCYC 227.** *Journal of General Microbiology* 136(9): 1990: 1747-1751

Batch cultures of a brewer's strain of *Sacch. cerevisiae*, NCYC 227, in a defined medium exhibited characteristic flocculation during the late exponential phase of growth. However, early exponential cells were non-flocculent and flocculation of such cells could not be induced even in the presence of Ca^{2+}. A specific glycoprotein, absent from the cell walls of non-flocculating exponentially growing cells of this yeast and those of non-flocculating strains of *Sacch. cerevisiae*, was identified on the cell wall surface of flocculating exponentially growing cells of *Sacch. cerevisiae* NCYC 227. Flocculent cells of *S. cerevisiae* NCYC 227 dispersed with EDTA and coated with monovalent Fab portions of the antibody showed reduced flocculation. Removal of the monovalent antibody portions from the cell surfaces induced cell flocculation in the presence of Ca^{2+}. These results suggest a role for this glycoprotein in yeast cell flocculation. AA

BIOTECHNOLOGY

45

Suvendu Bhattacharya. **Extruder as a bioreactor.** *Indian Food Industry* 11(1): 1992: 27-30

The use of an extruder as a bioreactor in the chemical and/or biochemical modification of food ingredients to create unique, new or improved properties is highlighted. Aspects covered are: the bioconversions through extrusion, liquefaction of starch, ethanol production and application of enzymes in food extrusion processes. CSA

46

Desai (NB), Dave (RI) and Thakar (PN). **Biotechnological approaches in dairy and food industries.** *Indian Food Industry* 11(2): 1992: 33-35, 39

Immobilization of cells and enzymes, genetic modifications, bacterial recombination processes (genetic engineering vis-a-vis dairy lactic acid bacteria, enzymes, modifications of proteins) and areas of biotechnological application are the aspects covered in this article. BV

47

Campanella (L), Cordatore (M), Mazzei (F), Tomassetti (M) and Volpe (G). **Phosphate determination in foodstuffs using a plant tissue electrode.** *Food Chemistry* 44(4): 1992: 291-297

The electrode was developed by addition of glucose oxidase to a slice of *Solanum tuberosum* containing the acid phosphatase enzyme and using an amperometric (lark electrode as indicating sensor. The phosphate determined in authentic matrices such as fresh and powdered milk, wine and tomato puree were compared with those obtained using Bartlett's spectrometric method. SD

48

Pariza (MW). **Foods of new biotechnology vs traditional products: Microbiological aspects.** *Food Technology* 46(3): 1992: 100-102

Aspects discussed in this article are the microbiological safety of new vs traditional foods: an approach to determining the safety of new foods and ingredients derived from engineered microorganisms: and the prospects for novel uses of microorganisms to further protect the food supply. CSA

49

Stewart (KK). **Food composition and analysis in the assessment of the safety of food produced by biotechnology.** *Food Technology* 46(3): 1992: 103-107

The article focusses on the problems related to the toxins produced naturally by plants and those of environmental origin that are concentrated by plants, as well as the safety assessment of plant foods produced and/or processed by biotechnology. CSA

TISSUE CULTURE

Nil

FOOD ADDITIVES

Antimicrobials

50

McKellar (RC), Paquet (A) and Ma (C-Y). **Antimicrobial activity of fatty N-acylamino acids against gram-positive foodborne pathogens.** *Food Microbiology* 9(1): 1992: 67-76

This study showed that myristoyl (C_{14}) derivatives gave the greatest antimicrobial activity, followed by lauroyl (C_{12}) and palmitoyl (C_{16}). Phenylalanine (derivative of aromatic amino acid) was most active. The min. inhibitory concn. (8.5 $\mu g ml^{-1}$) was obtained with the myristoyl-phenylalanine. Inhibitory activity was highest under mildly acidic (pH 6.0) condition. Fatty N-acylamino acids inhibited production of hemolysin by *Listeria monocytogenes*. The results suggest that fatty N-acylamino acids may have some potential use as multi-functional food additives. SRA

Flavourings

51

Burdock (GA) and Ford (RA). **Safety evaluation of dibenzyl ether.** *Food and Chemical Toxicology* 30(7): 1992: 559-566

Dibenzyl ether (FEMA No. 2371, CAS No. 103 50-4) was given in the diet to rats at a rate of 62, 196 or 620 mg/kg/day for 91 consecutive days. Body wts and food consumption were measured weekly; haematological, clinical chemistry and urinalysis values were obtained at wk 6 and 12. Gross and microscopic pathological changes were observed and organ wts recorded. The high-dose females had

increased absolute and relative liver wts: this was considered to be related to dose. Other statistically significant events that occurred sporadically within the test groups were unrelated to dose and were considered to be normal adaptive change. No toxicological or pathological effects were noted at any of the dose levels after 91 consecutive days of feeding dibenzyl ether. A no-effect level was achieved at 196 mg/kg/day. In a 60-kg human, this would be equivalent to approx. 11.8 g/day, assuming a direct relationship between dose and body wt. across species. Based on the possible av. daily intake of 19.2 mg/day, this would confer a safety factor of 600. The safety factor based on the more realistic consumption *per capita* of 23.6 µg/day would be approx. 500,000. AA

Stabilizers

Gums

52

Mukherjee (A), Agarwal (K) and Chakrabarti (J). **Genotoxicity studies of the food additive ester gum.** *Food and Chemical Toxicology* 30(7): 1992: 627-630

Oral administration of ester gum (EG, glycerol ester of wood rosin acids and chemically known as glycerol triabetate) at doses 50, 100 and 150 mg/kg body wt. to male Swiss albino mice did not induce any significant sister chromatid exchange and chromosomal aberration. The aberrations were mainly of the chromatid type. The clastogenicity was marginal and statistically significant for one sampling time (6 h) and only for the doses of 100 and 150 mg EG/kg body wt. BV

CEREALS

53

Rybka (K), Boros (D) and Raczynska-Bojanowska (K). **Comparative studes on the components of cereal grain that are undigestible *in vitro*.** *Journal of Cereal Science* 15(3): 1992: 295-303

The protein contents of the combined enzyme-extractable and enzyme-unextractable fractions in the procedure of Asp et al ranged from 17% in wheat to 27% in barley; 20 - 25% of the undigestible protein was found in the extractable fraction. The interspecies variability in the cereal grain components that were undigestible *in vitro* was due primarily to the enzyme-extractable fraction. The differences involved: (i) the amounts of saccharides solubilized during the digestion procedure (from 27 mg/g grain meal in wheat to 38 mg/g in rye); (ii) the saccharide/protein ratios (ranging from 7 in rye and triticale to 5 in wheat and barley); and (iii) the compositions of both polysaccharides and protein. Arabinose and xylose in the rye enzyme-extractable fraction comprised 80% of the total undigested polysaccharide, and for wheat and barley these values were 55% and 30%, respectively. The content of protein-bound basic amino acids in this fraction was also higher in rye than in other cereals. Variation was less among the enzyme-unextractable fractions. It appears that the content and composition of the enzyme-extractable fraction may influence the nutritive value of cereal grain significantly. Carbohydrate-protein conjugates in this fraction may also have an important effect. AA

54

Kazemie (M) and Bushuk (W). **Use of lithium chloride for the extraction of flour proteins.** *Cereal Chemistry* 69(1): 1992: 105-107

In this study, 2M lithium chloride (LiCl) appeared to be more effective than 70% ethanol sol. for extracting gliadins from wheat flour. In addition, it was found that after extraction with solvents containing LiCl and urea or acetic acid and urea, a group of low mol. wt. proteins (possibly reprecipitated gliadins) together with gelatinized starch could be removed from residue by gently dispersion in double-distilled water. The protein in final residue appeared to be glutenin. AA

Oats

55

Luikkonen (KH), Montfoort (A) and Laakso (SV). **Water-induced lipid changes in oat processing.** *Journal of Agricultural and Food Chemistry* 40(1): 1992: 126-130

Oat flours prepared from hulled, dehulled, or heat-treated grains were studied for lipid changes in aqueous suspensions. These data were compared to lipid profiles of fiber, protein, and starch fractions obtained in a wet fractionation process. The appearance of free fatty acids (FFA) at the expense of triglycerides (TG) but not their rapid oxidation was a response to water soaking of the flours; the lipids of hulled and dehulled grains were neither hydrolyzed nor oxidized under similar conditions. Wet fractionation of oat flour from nonheated grains resulted in TG hydrolysis in starch and protein fractions so that FFA content rose to 21% and 30%, respectively, while the lipids of fiber remained very similar to that of whole grains. Since TG, polar lipid, and FFA fractions in whole grains comprised about 78%, 19% and 3% of total lipids, very little of the oat's original lipid composition prevailed in the

starch and protein fractions. Therefore, prevention of lipid hydrolysis rather than oxidation should be a primary goal in the manufacture of nondeteriorated oat products. AA

56

Wood (PJ). **From oats to oat bran: Enrichment in β-glucan and potential nutritional benefits.** *Getreide-Mehl und Brot* 45(11); 1991; 327-331 (De)

57

Anon. **Efficacy of oat bran as a hypocholesterolemic agent.** *Nutrition Reviews* 48(7); 1990; 282-285

Addition of either high-fiber or low-fiber supplements to an ad-libitum diet resulted in equivical reductions in plasma cholesterol in normocholesterolemic men and women. AA

Rice

58

Andrews (SB), Siebenmorgen (TJ) and Mauromoustakos (A). **Evaluation of the McGill no. 2 rice miller.** *Cereal Chemistry* 69(1); 1992; 35-43

The effects of moisture content (MC), milling time, pressure applied to rice, and sample size on head rice yield and degree of milling were evaluted with the McGill No. 2 miller. MC was 9 - 14% (wb), milling time was 0 - 60 sec (in 15-sec intervals), and sample sizes were 100, 125, and 150 g of rough rice. The pressure applied to the rice was adjusted by varying the position of a 1.5-kg wt. on the wt. lever. Samples produced by milling at the experimental combinations were graded by the Federal Grain Inspection Service. MC was found to be the most significant variable and sample size the least significant variable in affecting head rice yield (HRY). When MC was decreased or sample size was increased, HRY increased. It was also determined that when milling time or pressure applied to the rice was increased, HRY decreased. HRYs obtained with the No. 2 miller were compared to yields obtained with the McGill No. 3 miller at corresponding MCs. It may be possible to obtain equivalent results with the proper settings. However, no one combination was found to produce equivalent results across all 4 MCs for both var. AA

Brown rice

59

Champagne (ET), Hron (RJSr) and Abraham (G). **Utilizing ethanol to produce stabilized brown rice products.** *Journal of the American Oil Chemist's Society* 69(3); 1992; 205-208

This paper discusses lipolytic hydrolysis and oxidation of kernel oil and methods for stabilizing the oil. An overview of processes in which ethanol is used in liquid and vapour states to stabilize brown rice to lipolytic hydrolysis is presented. BV

Rice bran

60

Tashiro (M) and Maki (Z). **Effects of dietary rice bran trypsin inhibitor on the growth and pancreatic weights of rats.** *Nutrition Research* 10(11); 1990; 1325-1330

Male weanling rats were fed a 11.5% casein basal diet or the casein diets containing rice bran trypsin inhibitor (RBTI) at levels of 1.0, 2.0 and 4.0 g/kg diet for 3 wks, and the response of rats to dietary RBTI was examined. Results showed that the body wt. gain and food efficiency of the 0.4% RBTI diet group were significantly lower than those of the basal diet group at 1 wk, but these differences disappeared at 2 wk. Apparent nitrogen digestiblity was also lower in the 0.4% RBTI diet group than in the basal when measured on days 3 and 4 after the start of the trial. Concerning pancreas, a significant increase in the wt. was observed in rats given diets containing 0.2% and 0.4% RBTI as compared to rats fed the basal diet, and the levels of trypsin and chymotrypsin activities tended to be higher in the RBTI diet groups than in the basal. These findings indicate that RBTI diets groups than in the basal. These findings indicate that RBTI diet consumption in weanling rats elicits physiological responses such as growth retardation and pancreatic enlargement. However, the deleterious effects of dietary RBTI seem to be ignored when the ingested level of RBTI is low under the conditions used in this study. AA

Wheat

61

Mahoney (RR) and Ramsay (M). **A rapid tyrosinase test for detecting contamination of durum wheat.** *Journal of Cereal Science* 15(3); 1992; 267-270

A tyrosinase test has been developed for detecting contamination of durum wheat by breadwheat (*T. aestivum*) cvs. Soaking the wheat seeds in tyrosinate solution and exposure to air leads to rapid darkening of the grain from aestivum cvs, which can then be distinguished readily from the durum wheat in 30 min or less. The substrate is non-toxic and safe to handle. The test will differentiate both hard and soft asetivum cvs from durum, and is suitable for use in quality control at the point of intake. AA

62

Crosbie (GB), Lambe (WJ), Tsutsui (H) and Gilmour (RF). **Further evaluation of the flour swelling volume test for identifying wheats potentially suitable for Japanese noodles.** *Journal of Cereal Science* 15(3): 1992: 271-280

The aim of this study was to further evaluate the flour swelling vol. test for rapidly identifying wheat breeding lines with grain quality potential for manufacturing white Japanese noodles. Certain improvements to the test are described, which improve the ease of measurement and increase sample throughput. The test was applied to flour milled to 60% extraction on a Buhler mill, flour from a Quadrumat Junior micromill and to wholemeal flour, using the grain of 16 cvs grown at two location in Western Australia. The swelling vol. of each type of flour was significantly ($P < 0.01$) correlated with total texture score and its components, namely balance of softness and hardness, elasticity and smoothness. Although some indication of non-linearity in these relationships is apparent, the test can clearly distinguish between high- and low-quality samples. The test is simple, rapid, safe and inexpensive, and is ideal for identifying those early generation lines in a wheat breeding programme that have potential for manufacturing white Japanese noodles. Used in its simplest form, test samples are rated in comparison with reference cv, on the basis of a quick inspection of gel height. AA

63

Brummer (J-M) and Seibel (W). **Baking quality of wheat from extensive ("low input") production.** *Getreide-Mehl und Brot* 45(11): 1991: 336-341 (De)

64

Sekhon (KS), Narpinder Singh and Pal Singh (R). **Studies on the improvement of quality of wheat infected with Karnal Bunt. I. Milling, rheological, and baking properties.** *Cereal Chemistry* 69(1): 1992: 50-54

Studies were conducted with a view to developing treatments to overcome the adverse effects of Karnal bunt (*Neovossia indica*) disease on the quality of wheat and its products. Among various treatments tried, lye peeling and debranning followed by washing were found to be very effective. The flour yield and quality (i.e., ash content, milling value, and colour grade value) of the Karnal-bunt-infected wheat were improved considerably by these treatments. The increase in proteolytic activity, total phenols, free fatty acids, and trimethylamine content due to bunt infection was reversed to an appreciable extent with the treatments. The deteriorated dough rheological characteristics and bread quality and acceptability of flour infected with Karnal bunt were also significantly improved. Bread prepared from 5% Karnal-bunt-infected wheat treated with either method was comparable to bread prepared from sound wheat. AA

65

Narpinder Singh, Sekhon (KS), Srivastava (AK) and Gupta (PP). **Studies on the improvement of quality of wheat infected with Karnal Bunt. II. Nutritional and biological effects.** *Cereal Chemistry* 69(1): 1992: 55-60

The effect of feeding diets of wheat containing Karnal bunt and trimethylamine to rats and the effectiveness of debranning and lye peeling in controlling the adverse biological effects of the infected wheat on rats were investigated. The trials revealed that gains in body wt. and PER were lowest for the diet containing 10 meq of trimethylamine. Packed cell vol. and neutrophils and monocytes in the blood of rats were significantly reduced by the presence of Karnal bunt or trimethylamine in the diets, while reticulocytes, leucocytes, lymphocytes and eosinophils increased. The adverse effects of Karnal bunt on the hematological parameters were largely overcome by debranning and lye peeling. These treatments significantly reduced the activities of various enzymes in different organs and the plasma of rats from levels found for the diets containing Karnal bunt or trimethylamine. AA

66

Ranhotra (GS), Gelroth (JA), Glaser (BK) and Posner (ES). **Total and soluble fiber content of air-classified white flour from hard and soft wheats.** *Cereal Chemistry* 69(1): 1992: 75-77

None of the flour streams from wheat milling that are combined to produce white (straight-grade) flour contain more total dietary fiber (TDF) or soluble fiber (SF) than white flour itself. However, air classification of white flour obtained from hard and soft wheats revealed that a subfraction, termed A-fine, contains nearly twice as much TDF and SF as the original flour. The A-fine subfraction also contained about 150% more protein as well as more fat and ash than the original flour. Bread made with the A-fine subfraction contained 14% fewer calories, 63% more TDF, and 67% more SF than bread made with the original flour. AA

Wheat bran

67

Glenn (GM) and Johnston (RK). **Moisture-dependent changes in the mechanical**

properties of isolated wheat bran. *Journal of Cereal Science* 15(3); 1992; 223-236

Wheat bran strips were isolated from disks cut from individual wheat caryopses and conditioned at 100% RH (h_r) to facilitate bran removal. The mechanical properties of the isolated wheat bran strips were obtained from force-deformation curves using uniaxial tension tests. The strips were tested at 0, 45, 71 and 100% h_r. The tensile strength (S_u), percentage deformation to fracture (e_{max}) and initial tangent modulus of elasticity (E) were similar for bran strips from radial and longitudinal orientations, suggesting that wheat bran is nearly isotropic in nature. There were no consistent differences in the mechanical properties of bran from hard or soft wheat classes, but some varietal differences in S_u and e_{max} were found. The S_u and E values for bran strips equilibrated at 100% h_r were only 37% and 10% respectively, of the values obtained at 45% h_r. The e_{max} values were more than 3 times greater for bran equilibrated at 100% h_r than at 45% h_r. The energy required to break the samples was not affected by changes in h_r. Elastic (D_e), residual (D_r) and total (D_t) deformation was measured in hysteresis test performed at 0% and 100% h_r. Sample deformation was much higher at 100% h_r than at 0% h_r. During five cycles of the hysteresis test, D_e remained relatively constant while D_r decreased with each cycle. AA

Wheat proteins

68

Shutton (KH), Hay (RL) and Mouat (CH). **The effect of kernel weight on the assessment of baking performance of wheats by RP-HPLC of glutenin subunits from single grains.** *Journal of Cereal Science* 15(3); 1992; 253-265

The baking performance of flour produced from grain fractions of the cv Otane increased with the av. kernel wt. of the fraction. The change in baking performance with kernel wt. for flours produced from grain fractions was predicted using RP-HPLC. Studies using single grains showed that, for Otane, the proportions of all the wheat storage proteins increased as a function of kernel wt., and that there was a high degree of grain-to-grain and sample-to-sample variability in both the total protein and HMW glutenin content. The accuracy of baking performance predictions for single grains using RP-HPLC was greatly improved when multiple, rather than single, grain analyses were performed. No relationship was found between the mean kernel wt. of individual samples and their baking performance. If this grain-size effect, and the high level of variability in protein content observed, can be demonstrated for other cvs, then rejection of a cv from a breeding programme on the basis of a single kernel test would be ill-advised, regardless of the method used to measure protein content. AA

Wheat starch

69

Delwiche (SR), Pitt (RE) and Norris (KH). **Sensitivity of near-infrared absorption to moisture content versus water activity in starch and cellulose.** *Cereal Chemistry* 69(1); 1992; 107-109

Near-infrared (NIR) diffuse reflectance spectra of wheat starch and microcrystalline cellulose were gathered at a_w levels of 0.43 and 0.53 attained through adsorption or desorption. The primary interest was whether NIR absorption was more directly sensitive to a_w or to moisture content (MC). Results indicate that NIR spectroscopy can discriminate between different MCs at the same a_w but is much less sensitive to different a_w at the same MC. This suggests that separate models are not required when using NIR spectroscopy to estimate MC of carbohydrates that have reached equilibrium along vapour adsorption and desorption pathways. However, the use of NIR spectroscopy to determine the susceptibility of starch and cellulose to a_w-related deterioration processes may be confounded by their sorption history. AA

70

Skerrit (JH) and Hill (AS). **How "free" is "gluten free"? Relationship between Kjeldahl nitrogen values and gluten protein content for wheat starches.** *Cereal Chemistry* 69(1); 1992; 110-112

Kjeldahl nitrogen analysis of wheat starches submitted to 3 different lab. showed poor precision. The relationship between mean total Kjeldahl protein (N x 5.7) and gluten content was analyzed using a commercially available laboratory test kit based on specific antibodies. In general, the first 0.25% protein contained very little gluten, whereas most protein above the 0.3% level was in the form of gluten. Thus a 0.4% protein starch may contain up to 10 times as much gluten as a 0.3% protein starch. It was difficult using sodium-dodecyl sulphate polyacrylamide gel electrophoresis of starch extracts to clearly distinguish gluten polypeptides from starch granule proteins and to differentiate wheat starches that differed only slightly in protein content but markedly in gluten content. AA

Corn

71

Urano (T), Trucksess (MW), Matusik (J) and Dorner (JW). **Liquid chromatographic determination of cyclopiazonic acid in corn and peanuts.** *Journal of AOAC International* 75(2); 1992; 319-322

A liquid chromatographic (LC) method is described for the detn. of cyclopiazonic acid (CPA) in corn and peanuts. CPA was extracted from the test portion with methanol-2% $NaHCO_3$ solution (7 + 3); the extract was defatted with hexane and then acidified. CPA was partitioned into chloroform and applied to a Sep-Pak silica cartridge. CPA was eluted with chloroform-methanol (3 + 1), the solvent was evaporated, and the residue was dissolved in methanol-water (60 + 40). CPA was quantitated by reversed-phase LC with a linear gradient of 0 - 4 mM $ZnSO_4$ in methanol-water (85 + 15) and UV measurement at 279 nm. Recoveries of CPA from corn spiked over the range of 50 - 500 ng/g and peanuts spiked over the range of 100 - 500 ng/g were 72 - 84% and 74 - 80%, respectively. The limits of quantitation for CPA in corn and peanuts were about 50 and 100 ng/g, respectively. CPA (820 ng/g) was found in corn naturally contaminated with aflatoxin B_1, and CPA identity was confirmed by tandem mass spectrometry. AA

72

Ruan (R) and Litchfield (JB). **Determination of water distribution and mobility inside maize kernels during steeping using magnetic resonance imaging.** *Cereal Chemistry* 69(1); 1992; 13-17

Differences in water content and mobility in various components of corn kernels during steeping were measured by magentic resonance imaging. The proton density and T_1 images (water distribution and mobility mapping) were obtained with a spatial resolution of 100 µm. The outside steepwater signal was well suppressed and the inside structure of the corn kernel was revealed clearly with proton density (p), spinlattice relaxation (T_1), and apparent spin-spin relaxation (T_2^*) images. The technique enabled clear definition of the principal tissues in corn kernels and provided quantitative information concerning differences in water distribution and mobility. AA

73

Wang (C) and Johnson (LA). **Wet-milling characteristics of propionate-treated high-moisture maize. I. Yields and compositions of products.** *Cereal Chemistry* 69(1); 1992; 43-46

High-moisture (25.6%) maize was treated with 3 forms of 1.0% propionate (wt. treatments adjusted to obtain equivalent moles of propionate ion). These were propionic acid (99% pure, pH 1.7), a mixture of sodium propionate and sodium acetate (as might be recovered from fermentation) acidified with HCl to the pKa of propionic acid (pH 4.8), and the same mixture of sodium propionate and sodium acetate acidified to the natural pH of propionic acid (pH 1.7). Another sample of maize was forced-air dried (25°C) to 12% moisture and used as an untreated control. Treated maize was stored at 25°C for 6 months before wet milling. When the grain was treated with propionate, yields of germ were lower and contained less protein and more oil compared with untreated air-dried maize because of increased leaching of protein from germ during steeping. Starch yields increased because of propionate treatment, but residual protein levels in the recovered starch were unacceptably high. Gluten yields and purities of propionate-treated high-moisture maize were lower than those of untreated air-dried maize. AA

74

Wang (C) and Johnson (LA). **Wet-milling characteristics of propionate-treated high-moisture maize. II. Qualities of starch and gluten.** *Cereal Chemistry* 69(1); 1992; 47-49

High-moisture (25.6%) maize was treated with 3 forms of 1.0% propionate (wt. treatments adjusted to obtain equivalent moles of propionate ion). These were propionic acid (99% pure, pH 1.7), a mixture of sodium propionate and sodium acetate acidified with HCl to the pKa of propionic acid (pH 4.8), and the same mixture of sodium propionate and sodium acetate acidified to the natural pH of propionic acid (pH 1.7). Another sample of the maize was forced-air dried (25°C) to 12% moisture content. Propionate-treated and untreated maize samples were stored at 25°C for 6 months before wet milling. Starch recovered from propionate-treated maize contained greater amounts of residual protein than did starch from untreated air-dried maize and was more yellow in colour. Starch from propionate-treated maize had lower pasting viscosities than did starch from untreated air-dried maize, indicating partial hydrolysis. No differences in the thermal properties of the starches were observed. Gluten from propionate-treated maize contained lower concn. of protein and was less yellow than gluten from untreated air-dried maize. Addition of a small amount of NaCl to the mill-starch slurry improved starch-gluten separation in propionate-treated maize. AA

75

Raeker (MO), Bern (CJ), Johnson (LA) and Glatz (BA). **Preservation of high-moisture maize by various propionate treatments.** *Cereal Chemistry* 69(1): 1992: 66-69

The feasibility of using propionates produced from fermentation of maize to preserve high-moisture maize was investigated. The preservative effects of regular (pH 9.60), semiacidified (pH 4.86), and acidified (pH 1.70) salt solutions of a mixture of sodium propionate and sodium acetate (4.86:1.00) and of pure propionic acid were determined at propionate levels of 0.5 and 1.0% on maize harvested during 1987 at 17.6, 23.0 and 26.8% moisture. In a second test, the propionate treatments were applied to maize harvested during 1988 at 26.8 and 29.6% moisture, except the regular salt solution was replaced with either simulated fermentation broth or actual fermentation broth enriched with pure propionic acid. All propionate treatments except the regular (unadjusted pH) salt sol. acted as fungicides and maintained maize in a mold-free condition for more than a yr. All treatments prevented growth of *Aspergillus flavus* inoculated into the maize. Propionic acid fermentation broths were as effective as pure propionic acid. Pure propionic acid maintained the colour of high-moisture maize better than did the other treatments. However, all propionate-treated samples were rated as "U.S. Sample Grade" at the end of 1 yr of storage because of objectionable odour and high total damage. AA

76

Mistry (AH) and Eckhoff (SR). **Dry milling and physical characteristics of alkali-debranned yellow dent corn.** *Cereal Chemistry* 69(1): 1992: 82-84

The physical characteristics and dry-milling performance of alkali-debranned and untreated yellow dent corn were compared using standard lab. procedures. The debranned corn had approx. the same amount of protein and oil but half the crude fiber content of the untreated corn. The yields of No. 5, 7 and 10 grits were much higher for debranned corn than for untreated corn, with the milling evaluation factor for debranned corn at 454, compared to 277 for the untreated corn. Debranned corn degermed much faster, resulting in cleaner and easier separation of germ. Although the germ fraction obtained from the debranned corn was lower in yield, it was higher in oil content and thus 35% less germ would be required to extract the same amount of oil as from untreated corn. The crude fiber content of grits and germ fractions obtained from debranned corn was 40 - 50% less than that obtained from untreated corn. The bran obtained by debranning the corn contained more crude fiber than that contained in the hull obtained by aspiration of untreated dry-milled corn. AA

77

Wilson (CM). **Zeins in sweet corn (*Sugary-1*).** *Cereal Chemistry* 69(1): 1992: 113

78

Thanaboripat (D), Ramunsri (W), Apintanapong (M) and Chusanatasana (K). **Effects of sodium chloride, propionic acid and ammonium hydroxide on growth of *Aspergillus flavus* on corn and aflatoxin production.** *ASEAN Food Journal* 7(1): 1992: 24-29

Sodium chloride at 40 and 80 mg/g concn. could inhibit only aflatoxin production while 120 mg/g NaCl inhibited both growth and aflatoxin production of *Asp. flavus* in corn after 7 and 14 days of incubation. The addition of propionic acid (PA) to the corn at 500, 1000 and 1500 µg/g concn. enhanced the production of aflatoxin whereas 2000 and 2500 µg/g of PA inhibited the formation of aflatoxin 0.2% NH_4OH reduced the production of aflatoxin in corn by 45 and 60% at 7 and 14 days respectively while 0.5, 1.0 and 1.5% NH_4OH completely inhibited the production of aflatoxin. SRA

Corn proteins

79

Hojilla-Evangelista (MP), Myers (DJ) and Johnson (LA). **Characterization of protein extracted from flaked, defatted, whole corn by the sequential extraction process.** *Journal of the American Oil Chemist's Society* 69(3): 1992: 199-204

An investigation was conducted to identify and characterize protein extracted by 45% ethanol:55% 0.1 M NaOH from flaked, defatted, undegermed corn (*Zea mays* L.) during Sequential Extraction Processing (SEP). This new approach to corn milling, SEP, recycles the ethanol produced from teh fermentation of corn starch to upstream steps of protein extraction and the simultaneous extraction of corn oil and dehydration of the ethanol. About 10% of the protein was extracted by ethanol during counter-current-percolation oil extraction. Sodium dodecyl sulphate-polyacrylamide gel electrophoresis (SDS-PAGE) and amino acid analysis identified this protein as zein. Nearly 65% of the total protein was recovered by the process in the protein extraction step from soft dent corn (Pioneer 3377), medium-hard dent corn (Pioneer 3732) and high-lysine corn. The freeze-dried solids of the ethanol/alkali extracts from these corn hybrids contained about 80% crude protein (db). The amino acids were present in quantities similar to those in

whole corn and markedly higher than those in corn gluten meal. These results indicate that SEP produces high-quality protein suitable for food and industrial uses. AA

Corn starch

80

Nyanzi (FA) and Maga (JA). **Effect of processing temperature on detergent-solubilized protein in extrusion-cooked corn starch/soy protein subunit blends.** *Journal of Agricultural and Food Chemistry* 40(1): 1992: 131-133

The effects of extrusion processing temp. (50, 100, 150°C) on protein solubilized by phosphate buffers (with and without sodium dodecyl sulphate (SDS)) were examined. The study was done utilizing corn starch/soy protein fraction model food systems. All samples containing β-conglycinin had the highest levels of protein solubilized by phosphate buffer at all processing temp. There was about a 5-fold increase in the level of phosphate buffer insoluble protein solubilized by SDS-phosphate buffer when unprocessed samples were compared with those processed at 50°C. Virtually all added protein (more than 0.9 g of protein/g of added protein) was solubilized by SDS-phosphate buffer in the samples containing β-conglycinin. Samples containing soy protein isolate or glycinin had lower levels of protein solubilized by both phosphate buffers. AA

PULSES

81

Kabirullah (M), Ahmed (R), Khan (SA), Rubbi (SF) and Faruque (O). **A comparative study on the nutritive value of Bangladesh FPC type-B and Norwegian FPC type-B and their potency to supplement a cereal-pulse diet.** *Bangaldesh Journal of Scientific and Industrial Research* 26(1-4): 1991: 8-18

To explore newer sources of protein-rich food, FPC type-B from 2 sources have been studied for their nutritive value and potency to supplement a cereal-pulse (CP) diet. Bangladesh FPC (BFPC) and Norwegian FPC (NFPC) showed PER values 2.00 plus or minus 0.00 and 2.04 plus or minus 0.08 respectively against the PER value of 3.04 plus or minus 0.03 observed for milk protein. Supplementation of about 5.3 g pulse protein in the CP diet with the FPC and milk protein significantly improved PER value, growth of normal rats, capacity to regenerate the growth of protein malnourished rats and in some cases the biological values. Results indicated that the two FPC are comparable in their overall nutritive value. A combination of an animal protein with a plant protein, raised the nutritive value of the mixture much higher than that of the animal protein fed alone. Further the results indicated that the FPC may be used in place of or parallel to milk in the supplementation of a CP diet and preparation of protein-rich food for vulnerable groups. AA

Cowpea

Cowpea pastes

82

McWatters (KH), Enwere (NJ) and Fletcher (SM). **Consumer response to akara (fried cowpea paste) served plain or with various sauces.** *Food Technology* 46(2): 1992: 111-114

Deals with the study conducted to assess the consumer acceptance of akara, a flavorful fried food from West Africa prepared from whipped and seasoned cowpea paste and served plain or with various sauces. The results show that the consumers were willing to pay more per piece for the fully cooked, convenient forms of akara than for those that required preparation and cooking. CSA

Faba beans

83

Schultz (M), Schmidt (G), Krause (J-P), Seifert (A) and Schmandke (H). **Low methoxy pectin/protein interaction in o/w emulsions - effects of acetylated faba bean globulin.** *Die Nahrung* 35(10): 1991: 1067-1069

The addition of low methoxy pectin to maximal acetylated faba bean globulin in o/w emulsion leads in the pH range between 5.5 and 6.5 to an increased protein content in the protein film around the oil droplets. This effect is accompanied with a rise of the apparent viscosity and flow behaviour index of the emulsions. In agreement with these modifications increased emulsion stability against creaming is found. AA

84

Alka Sharma and Salil Seghal. **Effect of processing and cooking on the antinutritional factors of faba bean (*Vicia faba*).** *Food Chemistry* 43(5): 1992: 383-385

Two var. (VH-131, WF) of faba bean were subjected to soaking, dehulling, ordinary cooking, autoclaving and sprouting. Soaked and dehulled seeds showed reductions in phytic acid (4%) and saponin (26 - 29%) in both var. and further autoclaving for 25 min resulted in max. loss of antinutrients. Antinutrient

concn. declined during germination proportionate to the period and lectin was found even after 48 h of sprouting. SD

Nuna

85

Van Beem (J), Kornegay (J) and Lareo (L). **Nutritive value of the nuna popping bean.** *Economic Botany* 46(2): 1992: 164-170

The nutritive value of raw, toasted and boiled nuna (*Phaseolus vulgaris*, grown in Andean highlands of South America and consumed as snack food after toasting process) and dry bean cv were compared and the extent to which lectins and tannins were deactivated in the toasting process were determined. Proximate analysis revealed that nunas has a higher starch, amylose and Cu content than 4 var. of dry bean and a lower protein, P, Fe and B content. Due to high starch content nunas had a unique taste and texture. Antinutritional factors like lectins were higher in raw and boiled nuna samples than in toasted ones. Tannin level did not show any change from raw to toasted treatments. Over all *in vitro* digestibility was slightly lower for toasted nunas than boiled dry bean. GS

Peas

86

Forni (E), Crivelli (G), Polesello (A) and Ghezzi (M). **Changes in peas due to freezing and storage.** *Journal of Food Processing Preservation* 15(6): 1991: 379-389

Peas (9 new lines and 1 cv) stored at -20°C for 6 months and analysed showed that blanching and freezing caused losses mainly of dry matter, acidity and sugar; colour was stable. No significant changes in chemical composition were observed. Colour, flavour, texture and appearance were acceptable both after freezing and cold storage for 6 months. SD

OILSEEDS AND NUTS

Rapeseeds

87

Bibi (N), Sattar (A) and Chaudry (MA). **Phenolic constituents in major fractions of tropical rapeseed.** *Die Nahrung* 35(10): 1991: 1053-1059

Commercial rapeseed var. (Ganyou-5, Westar, Raya-brown and Raya-yellow) grown under tropical conditions in Pakistan showed wide variations in different phenolic constituents in relation to extractants (methanol, methanol-HCl) used. Hulls of all var. contained higher levels of catechin, procyanidine, pronanthocyanidine and flavan-4-ols while lower amounts of sinapine, tannic acid and total phenols than the cotyledons. Cotyledons and hulls in seeds of Raya-brown were exceptionally high in procyanidine. BV

88

Ohlson (R). **Modern processing of rapeseed.** *Journal of the American Oil Chemist's Society* 69(3): 1992: 195-198

The various processing steps for rapeseed into finished oil and meal products are reviewed with special reference to the inclusion of an extruder step in oil extraction, an aqueous enzymatic process to separate flakes into oil, flour and molasses, the total degumming process, and the new central-Ad process to eliminate small quantities of impurities (dissolved or emulsified) from large volumes of liquid by a continuous adsorption-centrifugation technique. BV

Soybeans

89

Dornbos (DLJr) and Mullen (RE). **Soybean seed protein and oil contents and fatty acid composition adjustments by drought and temperature.** *Journal of the American Oil Chemist's Society* 69(3): 1992: 228-231

Both drought and high air temp. stress during soybean seed fill affect the proportion, quantity and quality of the seed oil and protein available to processors. Understanding the environmental conditions of the production environment may help processors predict the quantity and quality of the desired products obtainable from the soybean seed. BV

90

Mohamed (AI) and Rangappa (M). **Nutrient composition and anti-nutritional factors in vegetable soybean. II. Oil, fatty acids, sterols and lipoxygenase activity.** *Food Chemistry* 44(4): 1992: 277-282

Analysis of 17 vegetable soybean genotypes gave the following mean values: oil 18.44%, lipoxygenase activity 2176.3 units/min/mg meal; β-sitosterol 45.95%; stigmasterol 16.48%; campsterol 16.06%; dihydroxybrassicasterol 5.62%; linoleic 53.34% and linolenic acids 9.19% oleic was inversely correlated to linoleic (r = -0.820) and to linolenic (r = -0.663)

acids. Some of the cvs showed high oil, linoleic, linolenic and sterol content of vegetable-type soybeans. SD

91

Nowak (J) and Szebiotko (K). **Some biochemical changes during soybean and pea *tempeh* fermentation.** *Food Microbiology* 9(1): 1992: 37-43

This study reports some biochemical changes occuring during pea (*Pisum sativum*) and soybean (*Glycine max*) fermentation using *Rhizopus oligosporus* 2710. Soybean *tempeh* was made using 3 different schedules for the hydrothermal preparation of soybeans. Results showed that fermentation led to significant decrease in protein nitrogen and increase in ammonial-nitrogen and amino-nitrogen in soybean and pea. The preparation schedule of soybean resulted in differences in protein changes during fermentation. Fermentatión for 24 h at 37°C was not enough to decrease raffinose-family sugars in soybeans with or without husks. Incubation for 48 h decreased stachyose content. SRA

Soy products

Miso

92

Sautiago (LA), Hiramatsu (M) and Mori (A). **Japanese soybean paste *Miso* scavenges free radicals and inhibits lipid peroxidation.** *Journal of Nutritional Science and Vitaminology* 38(3): 1992: 297-304

Japanese soybean paste miso, which has been reported to prevent gastric and mammary cancer and chronic nephritis, was demostrated by electron spin resonance spectrometry using 5,5'-dimethyl-1-pyrroline-N-oxide as a scavenger of free radicals. 50 mg/ml of miso scavenged 100% of 1,1-diphenyl-2-picrylhydrazyl radicals (3.9×10^{15} spins/ml); and 50 mg/ml quenched 92% of hydroxyl radicals (7.9×10^{16} spins/ml); and 50 mg/ml quenched 50% of superoxide anion (6.7×10^{16} spins/ml). In the system of rat cerebral cortex homogenate supplemented with 2 mM each of Fe^{2} and ascorbic acid, 90% and 82% of the hydrogen and carbon-centred radicals having 1.7×10^{13} spins/ml and 3.9×10^{13} spins/ml, respectively, were quenched by 180 mg/ml of miso. The thiobarbituric acid-reactive substances, an index of lipid peroxidation in the brain, was inhibited by 10 mg/ml of miso. These results showed that miso acts as an antioxidant by scavenging free radicals. AA

Soy flour

93

Horvath (E) and Czukor (B). **Characterization of raw dielectric heated soybean flours of two different particle sizes.** *Acta Alimentaria* 20(1): 1991: 39-46

Raw and dielectric treated soy samples were milled to full-fat flours of particle size: 0 - 250 µm and 0 - 630 µm, respectively. Chemical composition, functional properties (water and fat absorption capacity, nitrogen solubility index), protein extractability (PE) and *in vitro* protein digestibility (PD) of samples were determined. Results showed that the studied functional properties except for water absorption capacity and PE of samples were decreased, *in vitro* PD was increased by dielectric heat treatment. The particle size of both raw dielectric treated samples affected their properties. Soy flours of smaller particle size (0 - 250 µm) had higher values of functional properties and higher PD and PE in buffer Na_2HPO_4 (pH = 7.8) and in this buffer containing either sodium dodecyl sulfate (SDS) or SDS + 2-mercaptoethanol than soy flours of particle size 0 - 630 µm. AA

Soy proteins

94

Lopez de ogara (MC), Delgado de Layno (M), Pilosof (AM) and Macchi (RA). **Functional properties of soy protein isolates as affected by heat treatment during isoelectric precipitation.** *Journal of the American Oil Chemist's Society* 69(2): 1992: 184-187

Research was carried out on the influence of heat treatment during isoelectric precipitation on the functionality of the resulting isolates prepared from "low-heated", undenatured, defatted soy flour. The isoelectric dispersions were heated at 50, 60, 65 or 70°C for 30 min and characterized for solubility, water absorption capacity, oil absorption capacity, viscosity and gel properties. The effect of heat treatment during isoelectric precipitation was reflected by all the functional properties. The soy isolate heated at 60°C showed remarkably different flow characteristics. It yielded the most viscous dispersions and the strongest gels and also the highest water absorption capacity value. Simple and multiple linear regression models were used to provide a description of the relationship between the different properties studied. Significant correlations were found between gel viscosity and water absorption capacity. Gel characteristics also correlated significantly with viscosity of 20% dispersions. Viscosity of dispersions correlated to solubility or to water absorption capacity, depending on protein concn. That dependence was quantified and a highly significant multiple correlation was

found between viscosity and the independent variables of log solubility and water absorption capacity. AA

95

Peterson (RE) and Wolf (WJ). **Enhancement of high-performance liquid chromatography of soybean proteins by addition of sodium dodecyl sulphate.** *Cereal Chemistry* 69(1): 1992: 101

TUBERS AND VEGETABLES

Carrots

96

Lund (ED) and Bruemmer (JH). **Sesquiterpene hydrocarbons in processed stored carrot sticks.** *Food Chemistry* 43(5): 1992: 331-335

Five types of infusion treated carrot sticks, with antimicrobial, antioxidant and cellular constituents, stored in plastic vacuum shrink bags at 2°C for 3 wks, showed marked decrease in 2 major sesquiterpene hydrocarbons (caryophyllene and γ-bisabolene) while the control showed moderate decrease in the second wk of storage. SD

97

Ben-Shalom (N), Plat (D), Levi (A) and Pinto (R). **Influence of pH treatment on pectic substances and firmness of blanched carrots.** *Food Chemistry* 44(4): 1992: 251-254

Firmness of carrot tissue ranged from 58 - 86N, reaching the max. at pH 4.4. After pH treatments, EDTA-soluble pectin increased after blanching at all pH; total pectin decreased at pH 4.4 compared to higher (6.2) or lower (3.9) pH values, and lower amounts of soluble pectin were found. Firmness and alkali-soluble pectin showed significant positive correlation. SD

Cassava

98

Adegoke (GO), Babalola (AK) and Akanni (AO). **Effects of sodium metabisulphite, hydrogen peroxide and heat on aflatoxin B1 in lafun and gari - two cassava products.** *Die Nahrung* 35(10): 1991: 1041-1045

Sodium metabisulphite (SMS) and H_2O_2 alone or in combination with heat (50 - 70°C) were found to be effective in degrading aflatoxin B1 (AFB1) in lafun and gari. H_2O_2 at a concn. of 3% in the aqueous phase gave a 12.5% degradation of AFB1 in lafun and at 50°C, degradation levels of 25% and 50% were obtained with 6.0 and 9.0% H_2O_2, respectively. When SMS was applied during the production of gari (a fermented cassava product heated to 50 - 70°C during production) AFB1 degradation levels were found to be 65.8%, 60.9%, 41.5% and 36.6%, respectively, for SMS levels of 1.0%, 0.8%, 0.5% and 0.3%. AA

Tapioca

Tapioca starch

99

Kumar (VNG), Bhandari (MV) and Bhat (AN). **Modifications of tapioca starch properties by polyethylene glycol (4000) and polyethylene glycol (4000) stearate additives.** *Starch/Starke* 43(3): 1991: 93-98

Changes in crystallinity, iodine binding capacity and infrared spectral characteristics of tapioca starch on incorporation of polyethylene glycol (4000) and polyethylene glycol (4000) distearate additives into gelatinised starch have been investigated. A plausible explanation for the appearance of crystallinity for gelatinised starch on incorporation of the additives is given. The additives were also shown to influence the gelatinisation temp. of native tapioca starch. The DSC studies indicating this effect are discussed in detail. AA

Vegetables

Leafy vegetables

Amaranthus

100

Kauffman (CS). **Realizing the potential of grain amaranth.** *Food Reviews International* 8(1): 1992: 5-21

Review. 95 references. SRA

101

Bressani (R), Sanchez-Marroquin (A) and Morales (E). **Chemical composition of grain amaranth cultivars and effects of processing on their nutritional quality.** *Food Reviews International* 8(1): 1992: 23-49

Review. 27 references. SRA

102

Gupta (VK) and Timba (D). **Grain amaranth: A promising crop for marginal areas of Kenya.** *Food Reviews International* 8(1): 1992: 51-69

Review. 8 references. SRA

103

Espita (E). **Amaranth germplasm development and agronomic studies in Mexico.** *Food Reviews International* 8(1): 1992: 71-86

Review. 7 references. SRA

104

Kalinowski (LS), Navarro (JP), Concha (AIR), Hermoza (GC), Pacheco (RA), Choquevilca (YC), Jara (EV). **Grain amaranth research in Peru.** *Food Reviews International* 8(1): 1992: 87-124

Review. 25 references. SRA

105

Duriyaprapan (S), Buranasilpin (P), Tanpanich (S), Chitnawasarn (S) and Watanakul (J). **Preliminary evaluation and screening of introduced amaranth in Thailand.** *Food Reviews International* 8(1): 1992: 125-142

Review. 11 references. SRA

106

Senthong (C), Julsrigival (S), Tiyawalee (D) and Wivutvongvana (P). **Germplasm screening of grain amaranth in Chiang Mai, Thailand.** *Food Reviews International* 8(1): 1992: 143-157

Review. 30 references. SRA

107

Kauffman (CS). **The status of grain amaranth for the 1990s.** *Food Reviews International* 8(1): 1992: 165-185

Review. 10 references. SRA

Amaranthus paniculatus starch

108

Singhal (RS) and Kulkarni (PR). **Studies on cross-linked *A. paniculatus* (Rajgeera) starch.** *Starch/Starke* 43(1): 1991: 15-18

Earlier studies on waxy *Amaranthus paniculatus* starch have shown it to be sensitive to mechanical shear and acidity. Cross-linking of this starch with phosphorus oxychloride at room temp. for 10 min using 5 ml $POCl_3$ per 100 g starch improved the stability under canning conditions, low pH and also mechanical shear. Its paste clarity also improved distinctly. However, it had very poor freeze-thaw stability indicating it to be unsuitable for frozen foods. Evaluation of this starch in canned tomato soup showed it to be a useful thickener for foods processed under retort conditions. AA

Tomatoes

109

Bessar (BAA), Korany (K) and Szabo (AS). **Effect of home preparative procedures and technological processes on lindane residues in tomato.** *Acta Alimentaria* 20(1): 1991: 25-29

Washing tomato fruits with water and detergents reduced lindane residues by 31.7% and 42.6% respectively immediately after treatment and 15 days later by 19.9% and 55.9% respectively of the initial amount present in unwashed samples. The prescribed waiting period of 15 days post treatment reduced the level of lindane residues to 23.9% of the initial amount found directly after treatment. All technological processes lowered lindane residue level from 19.9% to 50% immediately after treatment and from 17.5% to 100% after 15 days post treatment. BV

110

Tansakul (A), Noomhorm (A), Bhumiratana (S) and Patmayothin (N). **Effect of pulper-finisher specifications on tomato juice characteristics.** *ASEAN Food Journal* 7(1): 1992: 56-58

The chemical and physical characteristics of fresh VF-134 tomatoes used in this exp. with 2 pulper finishers (2-blade and 3-blade) showed the effect of different screen sizes (0.5, 1.0, 1.5 mm) and different speeds (100, 300, 500, 700 r.p.m.) on total solids, particle size distribution, consistency index and yield of tomato juice. For a 1.0 mm screen size and 700 r.p.m. speed, the consistency of tomato juice increased. At given speed the greater screen size allowed more tomato pulp, tomato serum resulting in higher yield of tomato juice. Yields, total solids of tomato juice, puree and pulp/serum ratio of tomato juice were higher from 3-blade pulp finisher than with 2 blades. Significant increases were observed for consistency index using 3-blade unit due to higher total solids, pulp/serum ratio. The operating combination of 1.0 mm screen and 700 r.p.m. speed produced highest consistency in tomato puree and juice in both pulper-finished. SRA

111

Kailasapathy (K) and Melton (LD). **Woolliness in stone fruits.** *ASEAN Food Journal* 7(1): 1992: 13-16

Briefly reviews the factors affecting woolliness, control of woolly break down pectolytic enzymes, pectic substances and woolliness, cell walls and woolliness. 40 references. SRA

Apples

112

Mandhar (SC), Singh (MD), Marcondes (JA) and Lee (JL). **Evaluation of apple packages under simulated transport conditions.** *Packaging India* 25(1): 1992: 31-34

Corrugated fibre board (CFB) containers used for export of apples were tested to the standards of American Society for Testing and Materials (ASTM D4169-86). The fully telescopic containers (FTC) could withstand the requisite dynamic compression load. The cushioning and isolation reduced the equivalent bruise index (EBI) from 89.58% to 38.74% for FTC. Small size FTC with corrugated fibre board cell pack is recommended for packaging of horticultural produce. AA

113

Macheix (J-J), Sapis (J-C) and Fleuriet (A). **Phenolic compounds and polyphenoloxidase in relation to browning in grapes and wines.** *CRC Critical Reviews in Food Science and Nutrition* 30(4): 1991: 441-486

The two main factors that determine the intensity of browning (oxidable substrate content and oxidasic activities), oxygen uptake and evolution of phenolic compounds associated with this browning, and the main approaches that can be used to control oxidation and browning intensity in wine processing are discussed in this article. 419 references. SRA

Citrus

114

Braddock (RJ) and Cadwallader (KR). **Citrus by-products manufacture for food use.** *Food Technology* 46(2): 1992: 105-110

Various processing techniques and isolation procedures of citrus by-products - dried pulp and pellets, molasses, essential oils (limonene, cold pressed oil, essences, bioconversion products), pectin, fiber, flavonoids and limonin, cloud, microbial products and other by-products for their efficient utilization for food use is covered. CSA

Grapes

115

Salinas (MR), Alonso (G), Navarro (G) and Pardo (F). **Contribution to study of the major aromatic components in the industrial processing of wine by carbonic maceration of Monastrell grapes. I: Isobutanol, 1-butanol, 2-methyl-1-butanol and 3-methyl-1-b.utanol.** *Anales de Bromatologia* 42(2): 1990: 209-217 (Es)

116

Salinas (MR), Alonso (G), Navarro (G) and Pardo (F). **Contribution to study of the major aromatic components in the industrial processing of wine by carbonic maceration of Monastrell grapes. II: Ethyl acetate, isopentyl acetate, methyl acetate, ethyl .formate and ethyl propionate.** *Anales de Bromatologia* 42(2): 1990: 219-226 (Es)

Papayas

117

Rangaswamy (K), Karunanithi (R), Jesudas (DM) and Swaminathan (KR). **The new tray for papain collection is a low-cost one.** *Indian Horticulture* 37(1): 1992: 24, 27

A low-cost new tray for collection of papain developed by Tamil Nadu Agricultural University, Coimbatore, is convenient to fix and remove from papaya trunk. The identical or symmetrical parts of tray are fixed to the plant by a flexible curved sheet metal clamp or fixture and a canvas strap or rope. The frame can accommodate a nylon or polythene sheet fixed either by stitching or clips. The new tray has completely overcome the constraints of the traditional trays. It weighs 500 g, easy to fabricate and costs Rs. 20. SRA

118

Soponronnarit (S), Achariyaviriya (S) and Tasaso (P). **Optimum strategies for drying papaya glace.** *ASEAN Food Journal* 7(1): 1992: 17-23

This study reports the development of a mathematical model which can predict the drying (cabinet drying papaya glace) rate with fair accuracy at an initial product moisture content of about 45% d.b. Variables considered were air-flow rate, air temp. and fraction of air recycled. The criteria for optimum drying of papaya glace in a cabinet dryer were product quality, drying time and energy consumption. Experimental and simulated results

showed that a drying temp. of 65°C, a specific air flow rate of about 50 kg dry air/h-kg dry papaya glace and about 0.8 of air recycled should be used. SRA

119

Chan (HTJr) and Ramanajaneya (KH). **Enzymatic deoxygenation of aseptically packaged papaya puree during storage.** *ASEAN Food Journal* 7(1): 1992: 47-50

Sapota

120

Man (YC), Taufik and Karim (MNA). **Storage stability of ciku leather.** *ASEAN Food Journal* 7(1): 1992: 53-55

Storage studies of ciku (*Achras sapota* L.) leather (intermediate moisture food) conducted over 3 months showed no significant difference in taste, colour, firmness or overall acceptability. Due to the low a_w and the presence of sorbic acid and $Na_2H_2SO_4$ in the formulation, the mould counts were low (4.7×10^1 to 5.0×10^1/g). Results of this study indicate that ciku leather was stable at ambient temp. (27°C) and 5°C for 3 months. BV

CONFECTIONERY, STARCH AND SUGAR

121

Schulze (J) and Zunft (H-J). **Lactose - a potential dietary fiber. On the regulation of its microecological efficiency in the intestinal tract. Part 3. Dietary fibre effects of lactose due to microbial activity.** *Die Nahrung* 35(9): 1991: 903-920 (De)

The activity of the mucosal β-galactosidase of caecum and colon is low in both germfree and conventional rats. β-Galactosidase activity occurs also in the chymus of germfree rats. It increases after monoassociation and is higher in conventional than in germfree animals. Lactose entering caecum and colon acts like dietary fibre and is hydrolysed mainly by the intestinal flora. Aerobe lactobacilli and bacteroides predominate in the microflora of rat caecum and colon. A lactose-containing diet increases the total number of germs and stimulates the growth of bifidobacteria. After special diets, rich in lactose and low in protein and phosphate (e.g. human milk and similar formulae), the number of bacteriodes and other putrefactive germs decreases. Moreover, a lactose-containing diet alters the metabolic activity of intestinal microorganisms (activity of microbial β-galactosidase, acidification and lowering of pH in the chymus, production of hydrogen, proteolytic activity). Lactose as dietary fibre decreases the nitrogen excretion in the urine and increases the N-excretion in the faeces of conventional rats. AA

122

Zunft (H-J) and Schulze (J). **Lactose - a potential dietary fibre. On the regulation of its microecological efficiency in the intestinal tract. Part 4. Dietary fibre effects of lactose: Evaluation by multiple statistical .methods.** *Die Nahrung* 35(9): 1991: 921-948 (De)

The conditions and the intestinal processes responsible for the action of lactose dietary fibre are described. The β-galactosidase activity in the rat caecum and colon is influenced by dietary factors. It declines with increasing lactose concn. and it rises with increasing protein and phosphate concn. in the diet. The enzyme activity correlates negatively with the content of lactose, and positively with the content of protein and phosphate in the chymus. The products of lactose hydrolysis are degraded by microbial glycolysis in caecum and colon. The glycolytic products are mainly absorbed and energetically utilized by the macroorganism. Phosphate stimulates the microbial metabolism and, therefore, accelerates the consumption of the energy substrate lactose. Mathematical optimization gives the necessary composition of the diet which causes an intended microecological effect. To minimize the chymus pH (5.1 in the colon ascendens; 4.6 in the colon descendens; 4.3 in the faeces) the lactose content of the diet has to be greater than or equal to 160 µmol/g, the protein content less than or equal to 10 mg/g, and the phosphate content less than or equal to 5.5 µmol/g. The minimal pH value depends to a greater extent on variations in the supply of protein and phosphorus with the diet whereas the response to changes in lactose concn. is less noticeable. AA

Confectionery

123

Kumar (KR). **Packaging aspects of confectionery items.** *Indian Food Industry* 11(1): 1992: 34-39

The packaging requirements of confectionery items (hard boiled sugar confectionery, toffees, gums and chocolates) are discussed. Summarises the physico-chemical property requirements of packages for confectionery items and the characteristics of packaging materials and package forms of cellulosics, polyolefins, vinyls, polyester and polyamides, nylons, metallized films, Al foil, multilayer flexible packaging materials (paper-board cartons, plastic containers and metal containers). CSA

Honeys

124

Sancho (MT), Muniategui (S), Huidobro (JF) and Lozano (JS). **Aging of honey.** *Journal of Agricultural and Food Chemistry* 40(1): 1992: 134-138

Diastase number (DN) and hydroxymethylfurfural (HXMF) content were determined for 115 honey samples at 4, 16, and 28 months after their extraction. The mean values for all samples show linear relations between DN and the logarithm of the time and between the logarithm of the HXMF content and the time. In these honeys, the long-term effects of heat and storage affect the increase in HXMF content to a greater degree; however, given the nature of some samples, the DN is the limiting factor for freshness in the short term. The factors determining the freshness date of the honeys were also studied and suggestions made for a quality control rule. AA

Starch

125

Upadhyay (CM), Nehete (PN), Shah (DN), Shah (NK), Shankar (V), Kothari (RM). **Alternate economical starchy substrates for the production of 70% sorbitol.** *Starch/Starke* 43(3): 1991: 107-113

In view of the soaring prices of corn and tapioca starch, use of their hydrolysate in the production of 70% sorbitol became less remunerative. Therefore, an economical alternative is explored by using hydrolysates of cereal flours, namely, rice (*Oryza sativa*), wheat (*Triticum aestivum*), jowar (*Sorghum vulgare*) and bajra (*Pennisetum typhoideum*). A protocol is devised to a) prepared their high DE hydrolysates, b) purify it after saccharification, c) monitor the chemical characteristics of conc. hydrolysate, as feedstock for Raney nickel catalyzed pressure of hydrogenation and d)finally prepare 70% sorbitol. Merits and demerits of hydrolysates of these cereal flours are discussed in terms of operational limitations and percentage recovery, the governing factors for their industrial acceptability. Rice flour hydrolysate appears to be an alternative substrate, operationally and economically. AA

126

Jane (J-L) and Chen (J-F). **Effect of amylose molecular size and amylopectin branch chain length on paste properties of starch.** *Cereal Chemistry* 69(1): 1992: 60-65

Amyloses were fractionated from potato, normal and high-amylose corn VII starches to yield large, intermediate, and small mol. wt. amyloses, respectively. Amylopectin were fractionated from high-amylose corn V, waxy corn, and normal rice starches to yield long, intermediate, and short branch chain amylopectins, respectively. Reconstituted starches made with mixtures of these amyloses and amylopectins at different combinations and proportions were studied for their paste properties (viscosity, gel strength, and light transmittance). Synergistic effects on paste viscosities were observed when the amyloses and amylopectin were mixed. The long branch chain amylopectin and the intermediate mol. size amylose produce the greatest synergistic effect on viscosity. AA

127

Carr (ME), Kim (S), Yoon (KJ) and Stanley (KD). **Graft polymerization of cationic methacrylate, acrylamide, and acrylonitrile monomers onto starch by reactive extrusion.** *Cereal Chemistry* 69(1): 1992: 70-75

Starch graft copolymers were prepared from cationic methacrylate (CM), acrylamide (AAm), and acrylonitrile (AN) monomers by continuous twin-screw extrusion processing. The monomers were reacted separately with corn starch under various conditions in the extruder with ceric ammonium nitrate (CAN) as the initiator. The purpose of the study was to determine the feasibility of grafting substantial levels of monomer onto the starch within brief reaction periods of 3-7 min. Effects of temp., monomer-starch wt. ratio, starch concn., CAN addition level, screw speed, and other variables in the extrusion process were studied. For comparison, starch graft copolymers from these monomers were prepared by typical 2 h batch processes at relatively low material concn., temp., and shear stress conditions. In extrusion processing, starch graft polyacrylonitrile (St-g-PAN) copolymer products with high conversion of monomer to polymer (74 - 78%) and high synthetic polymer add-on (42 - 44% of product wt.) were achieved within a reaction period of 7 min. Under similar extrusion conditions, add-on was 16 - 19% and conversion was 19 - 23% for AAm. Max. add-on was only 6.7% for the CM monomer. AAm also was reacted with waxy maize to give 18 - 23% add-on. The waxy maize copolymers were more water soluble than the corn starch copolymers. Results suggest that the continuous extrusion process could be particularly promising as a viable means of rapidly and efficiently producing St-g-PAN copolymers that are useful after saponification as commercial water-absorbent materials. AA

128

Jane (J-L), Shen (L) and Aguilar (F). **Characterization of pejibaye starch.** *Cereal Chemistry* 69(1): 1992: 96-100

Starches were isolated from dried fruits of pejibaye palm (*Bactris gasipaes*) grown in the following regions of Costa Rica: Sarapiqui, Limon, Guapiles, Parrita, and Turrialba. Pasting, gelling, and thermal properties of the starches were investigated. Amylose and phosphorus contents, amylose mol. size, and amylopectin branch chain lengths were analyzed. Onset of gelatinization temp. varied from 49 to 53°C. Enthalpy changes varied from 2.2 to 2.7 cal/g. Viscosity consistency of the starch pastes (8%, dry-starch basis) at 52°C varied from 520 to 1,100 BU (using a Brabender Viscoamylograph). Amylose contents varied from 8 to 19%, and P contents ranged from 0.049 to 0.054%. Branch chain lengths of amylopectin determined with the peak fractions had degrees of polymerization of 18 and 30 for short and long branches, respectively. Physical property variations were mainly attributed to differences in amylose contents and amylopectin structures. AA

BAKERY PRODUCTS

129

Narpinder Singh, Harinder (K), Sekhon (KS) and Bhupinder Kaur. **Studies on the improvement of functional and baking properties of wheat-chickpea flour blends.** *Journal of Food Processing Preservation* 15(6): 1991: 391-402

Wheat flour was blended with chickpea flour (CF) (10, 20 and 30%) gluten (1.5, 3, 4.5 and 6%) and sodium steroyl-lactyiate (SSL) 0.5% CF at 10 and 20% improved the dough stability and degree of softening while loaf vol., specific vol. and crumb softness of bread decreased with increased CF. Gluten at 3% level effectively improved the rheological, loaf vol. and crumb characteristics. In chapathi, puffing and softness, which deteriorated with increased CF, were improved by SSL. In cookie, SSL improved the spread factor upto 10% CF level while softness improved with increased CF. SD

130

Sinha (LK). **Use of soy flour in bakery products.** *Indian Baker* 23(3): 1992: 13-17

Soy flour with its high lysine content increases the protein content of bakery products and improves amino acid balance, increases water absorption, decreases mixing time, reduces fermentation. It also results in less-fat consumption, emulsification, structure building, textural improvements, crumb tenderness, crumb whiteness and extension of shelf-life. Soy flour supplementation enriches functional and nutritional properties of baked products (bread, cake, biscuit and doughnuts). SD

131

Vaidehi (MP), Jamuna and Mushtari Begum (J). **Acceptability and storage study of iron and vitamin-A enriched baked products.** *Indian Baker* 23(3): 1992: 21-27

Thirteen types of bakery products for nutritionally deficient (anaemia, vitamin-A deficiency) population were developed, using wheat flour supplemented with 10 - 15% defatted soy flour for biscuits and 5 - 10% for cakes and breads. Biscuits showed a longer shelf-life (9 days) than cakes, bread and puffs (4 - 6 days). The products developed commonly for both anaemia and vitamin-A deficiency were more acceptable than the products developed particularly for anaemia or for vitamin-A deficiency. BV

132

Vollmar (A) and Meuser (F). **Influence of starter cultures consisting of lactic acid bacteria and yeasts on the performance of a continuous sourdough fermenter.** *Cereal Chemistry* 69(1): 1992: 20-27

The performance of a newly developed, continuously operating sourdough fermentation system is dependent on the attainable metabolic activity of the microorganisms under the processing conditions. Of 8 pure cultures of lactic acid bateria, one with *Lactobacillus brevis* ssp. Lindneri produced the best results, that is, a high, uniform formation of acids and a balanced proportion of acetic acid (23 - 33%) to total acid. Similarly good results were obtained with *L. fructivorans*. The performance of the fermenter can be improved and stabilized by adding starting cultures of yeasts isolated from sourdoughs. In the given fermentation time, fermenting sourdoughs with added yeast showed a significantly higher acid formation than did those without (P > 95%) added yeast. The accelerated acid formation was due almost entirely to additional production of acetic acid. This effect was independent of the strain of yeast. Yeast additions above a certain level had no further influence. AA

Biscuits

133

Seibel (W), Brack (G), Hanneforth (U) and Sarhan (M). **Dietary fibre enrichment of biscuits.** *Getreide-Mehl und Brot* 45(9): 1991: 279-286 (De)

134

Yamada (Y) and Preston (KR). **Effects of individual oxidants on oven rise and bread properties of Canadian short process bread.** *Journal of Cereal Science* 15(3): 1992: 237-251

The effects of individual oxidants, including iodate, azodicarbonamide, ascorbic acid and bromate, on the oven rise and bread properties of Candadian short process bread have been studied using a straight grade Canadian red spring wheat flour. Addition of increasing levels of oxidant resulted in large increases in oven rise that corresponded closely with improvements in loaf vol. and bread score. Over-oxidation resulted in a loss of oven rise and corresponding decreases in bread quality. At optimum levels, all oxidants were equally effective in promoting oven rise and improving loaf vol. and bread score. Increased oven rise with increasing oxidation could be attributed to an increase in the time over which this process occurred. It is suggested that the increase in the time of oven rise associated with oxidation may, in addition to effects upon viscoelastic properties, be associated with an increase in the denaturation temp. of the gluten protein matrix supporting the gas cells. AA

135

Turk (M) and Sandberg (A-S). **Phytate degradation during breadmaking: Effect of phytase addition.** *Journal of Cereal Science* 15(3): 1992: 281-294

Bread was made using whole wheat flour and flour of 60% extraction, and inositol hexaphosphate and its hydrolysis products were measured by HPLC in both doughs and breads. Addition of a phytase preparation from *Aspergillus niger* to the doughs resulted in an increased degradation of phytate. When milk was included in the dough formulation, phytate degradation was inhibited alomst completely, but fermented milk had no effect. Lactic acid, whether in the presence or absence of calcium chloride, inhibited phytate degradation, although when phytase was added phytate hydrolysis was complete. AA

136

Johnson (J) and Vickers (Z). **Sensory-specific satiety for selected bread products.** *Journal of Sensory Studies* 6(2): 1991: 65-79

The first 2 principal components selected out of 42 attributes scored by panel with 26 bread samples were designated as richness and nutrition/fibre dimensions were tested for their sensory-specific satiety in bread products. Panelists rated their liking before and after eating 400 calorie serving of each sample and the measurements of hunger were also noted. The richness dimension did not affect the sensory-specific satiety and high nutrition/fibre dimension decreased hunger as well as liking. SD

137

Rasco (BA) and Dong (FM). **Baking and storage stability properties of high fibre breads containing comparable levels of different fiber ingredients.** *Journal of Food Processing Preservation* 15(6): 1991: 433-442

Mixing, baking and storage properteis of high fibre (wheat bran, wheat distiller's grain, soybean, barley spent grain, or oat fiber) yeast breads (13% TDF as basis) varied widely. Bread samples containing wheat bran, wheat distiller's grain solubles and oat fibre retain softness better during storage at room temp. than the other high fibre breads. SD

138

Mettler (E), Seibel (W), Munzing (K), Fast (U) and Pfeilsticker (K). **Experimental studies on the effects of emulsifiers and gums in order to optimize the quality of wheat bread. Part 3. Analytical and rheological studies on the effects of emulsifiers during the .baking procedures.** *Getreide-Mehl und Brot* 45(9): 1991: 273-279 (De)

139

Vohra (JC). **Baker's yeast and its role in bread making.** *Indian Baker* 23(3): 1992: 19-20

Baker's yeast increases dough vol. by evolution of CO_2 (leavening); develops structure and texture in the dough (dough maturing); improves flavour and nutritive value of the bread. SD

140

Carr (NO), Daniels (NWR) and Frazier (PJ). **Lipid interactions in breadmaking.** *CRC Critical Reviews in Food Science and Nutrition* 31(3): 1992: 237-258

The natural lipids of flour and added fats play an important role during bread production. In this review, the chemical and physical interactions of fat have been assessed in an attempt to explain these technological functions. Binding or complexing of lipid by flour proteins during the development of dough is emphasised. 164 references. SRA

141

He (H) and Hoseney (RC). **Factors controlling gas retention in nonheated doughs.** *Cereal Chemistry* 69(1): 1992: 1-6

When fully fermented and molded doughs made from 6 flours of differing baking quality were allowed to proof for an extended time, each dough expanded to its max. The max. dough proof height was highly correlated (r = 0.990) to loaf vol. of bread produced by the same flours. Rheological study showed that the poor-quality flour dough was stiffer and less deformable under a constant stress than the good-quality flour. The gluten from poor-quality flour appeared to be easier to hydrate, more viscous, and less elastic than the good-quality gluten. However, doughs from the poor-quality flour were stiffer with less flow than doughs from the good-quality flour. Conclusions drawn from observations of the microscopic structure of optimally mixed dough indicated that the poor-quality gluten interacted strongly with starch granules. That interaction may decrease the flow properties of dough. Observations of the gas cells in fermenting dough from good-quality flour dough showed that they grew uniformly with time. However, in poor-quality flour dough, only a small number of cells enlarged, and most of the small cells expanded only slightly. The smaller flow properties of the poor-quality dough apparently did not allow the gas cells to expand at a rate fast enough to equalize the pressure. Thus, as the pressure in the cells increased, less CO_2 diffused into the cells and more gas diffused to the atmosphere, which resulted in a smaller loaf. AA

142

He (H) and Hoseney (RC). **Effect of the quantity of wheat flour protein on bread loaf volume.** *Cereal Chemistry* 69(1): 1992: 17-19

The effect of flour protein content on dough expansion and rate of CO_2 loss from doughs during baking and extended proofing were studied. When baked in a conventional oven, the doughs containing more protein expanded at a faster rate than those containing less protein. Profiles of CO_2 loss from doughs during baking were not significantly affected by flour protein contents above 8.5%. When proofed for an extended period, the doughs containing more protein expanded at a faster rate and, more importantly, continued to expand longer than the doughs containing less protein. The difference in dough expansion rate might be attributed to the effect of flour protein on dough extensibility. Calculation of the difference in thickness of gas cell walls between doughs containing 8.5 and 11.5% protein suggests that the extent of dough expansion is mainly determined by how thin the gas cell walls can be stretched before reaching their expansion limit. AA

Dough

143

Kaufmann (B) and Kuhn (M). **Influence of additives on the rheology of doughs from whole wheat flours.** *Getreide-Mehl und Brot* 45(9): 1991: 269-273 (De)

144

Vollmar (A) and Meuser (F). **Optimisation of the productivity of a continuous sour dough fermentation.** *Getreide-Mehl und Brot* 45(11): 1991: 331-335 (De)

145

Lindahl (L) and Eliasson (A-C). **A comparison of some rheological properties of durum and wheat flour doughs.** *Cereal Chemistry* 69(1): 1992: 30-34

The rheological behaviour of doughs made from 3 commercial blends of wheat flours were compared. Two of the flours were wheat blends suitable for bread baking but milled quite differently. One was milled in the same way as the third, a durum wheat. The durum wheat flour contained 50% more protein than the 2 wheat blends and had a larger granulation after milling. The doughs were studied at 2 levels of water addition (35 and 45% mb) and analyzed in oscillation tests, and the elastic modulus and phase angle were measured. It was found that doughs of similar rheological behaviour could be obtained from flours differing considerably in protein content by manipulating particle size distribution and damaged starch content. A correlation between the elastic modulus and the amount of damaged starch was found when the level of starch damage was below 10%. The flours analyzed showed fairly good linear viscoelastic behaviour when limited strain values were applied and when the changes in the applied strain values with time were limited. AA

146

Hosomi (K), Nishio (K) and Matsumoto (H). **Studies on frozen dough baking. I. Effects of egg yolk and sugar ester.** *Cereal Chemistry* 69(1): 1992: 89-92

Improvements in the baking properties of frozen dough with egg yolk and sugar ester were studied by test baking, estimations of the gassing power and dough expansion, dough expansion test under decreased pressure, and surface membrane tension of thawed doughs after frozen storage for up to 3 wks. The observed effects of the additives were assumed to be brought about both by protection of yeast cells from damage and by prevention of dough proteins from denaturation by freezing, frozen storage, and thawing. AA

Pasta

147

Giese (J). **Pasta: New twists on an old product.** *Food Technology* 46(2): 1992: 118-126

Different types of pasta (microwavable pasta, retortable pasta, unconventional pasta, diet oriented pasta and fanciful pasta), the ingredients, processes and packaging used to assemble such products as fresh pasta packaged in modified atm., pasta developed to withstand the rigors of retorting and microwave cooking and pasta that eliminates the need for boiling during preparation are described. CSA

Spagheties

148

Matsuo (RR), Malcolmson (LJ), Edwards (NM) and Dexter (JE). **A colorimetric method for estimating spaghetti cooking losses.** *Cereal Chemistry* 69(1): 1992: 27-29

The amount of residue in the cooking water is widely used as an indicator of cooked spaghetti quality. Traditional methods are time-consuming and in some instances give results that are difficult to reproduce. A quicker and more precise method was developed by reacting a clarified aliquot of cooking water with iodine and measuring the absorbance at 650 nm, the absorption max. for the amylose-iodine complex. Strong linear relationships ($r^2 > 0.80$) were found between iodine absorption and cooking loss for both durum wheat and hard red spring wheat, indicating that cooking loss can be estimated reliably from iodine absorption values. AA

Tortillas

149

Serna-Saldivar (SO), Rooney (LW) and Greene (LW). **Effects of lime treatment on the bioavailability of calcium in diets of tortillas and beans: Bone and plasma composition in rats.** *Cereal Chemistry* 69(1): 1992: 78-81

The properties and composition of femurs and plasma of weanling rats fed (for 8 wks) regular corn, raw grains of quality protein maize (QPM) or sorghum, or tortilla-based diets supplemented with and without Ca were determined. The femurs of rats fed tortillas weighed more; were thicker and longer ($P < 0.05$); contained more ash, Ca, P, and Mg; and had less moisture and organic matter ($P < 0.05$) than those of rats fed raw grains. Femurs of rats fed tortillas were denser ($P < 0.05$) and at least 5 times stronger ($P < 0.05$) than those of rats fed raw grains. Among rats fed tortillas, QPM produced denser, stronger, longer, and thicker bones with more ash and Ca, followed by sorghum and regular corn tortillas. Supplementation of raw grain diets with Ca considerably improved the properties and mineral composition of the femur and serum Ca levels. These changes were not as marked when tortilla-based diets were supplemented with Ca. Serum Ca levels were approx. 30% lower for rats fed raw grains without supplemented Ca. Ca supplementation of QPM and sorghum tortillas had a marginal effect on serum Ca levels. Hypocalcemia was related to low serum albumin levels. Rats fed Ca-supplemented QPM products had the highest serum albumin levels ($P < 0.05$), probably because of the improved dietary protein quality. AA

MILK AND DAIRY PRODUCTS

Milk

150

Patel (RS), Gupta (VK), Singh (S) and Retter (H). **Ultrafiltration behaviour of buffalo and cow milk.** *Indian Journal of Dairy Science* 45(6): 1992: 322-325

As the solids concn. in the retenate increased, there was a steady decrease in the flux rate regardless of milk systems studied. The drop in flux was a little faster in milk having 8% fat then milk having 3% fat and skim-milk 0.1% fat. The difference in permeate flux rate may be due to the higher viscosity of whole milk as compared to skim-milk. The UF concn. of buffalo milk had 6%, buffalo skim-milk 0.1%, cow milk 3.5% and cow skim-milk 0.1% fat. The max total solids was obtained in buffalo milk retenate (42.83%) whereas it was 25.70, 37.33 and 24.71% in buffalo skim-milk, cow milk and cow skim-milk respectively. The % reduction of mass in buffalo milk was 70.17, skim-milk 75.99, cow milk 79.17 and skim-milk 80.07%. The viscosity of buffalo whole and skim and cow whole and skim at 20°C was 51.985, 25.361, 34.432, and 23.432 at 42.83, 25.70, 37.33 and 24.71% respectively. SRA

151

Datta (AK). **Ultra-high-temperature sterilization of milk in India.** *Indian Food Industry* 11(2): 1992: 36-39

The paper presents an overview of 2 major problems on nutritional quality of UHT sterilized milk and the existence of fouling problem in the heat exchangers and deals with the examination of the thermal requirement of UHT sterilization of milk. CSA

152

Prasad (C) and Balachandran (R). **Chromatographic patterns of serum proteins of fresh and stored buffalo milk concentrates.** *Indian Journal of Dairy Science* 44(5): 1991; 333-347

Studies were conducted to elucidate the status of soluble proteins fractions obtained from freshly prepared and stored (30 and 37°C) sterilized buffalo milk concentrates by elution profile from chromatography through Sephadex G-100 column. Results of chromatographic profile revealed that at the manufacture only shifting in relative proportions of peak area took place which indicated the tendency towards coalescence at various levels of total solids (TS). But during storage at 25% TS level first coalesence took place which on further storage fragmented into smaller fractions. At higher temp. of storage and also at higher TS these changes were observed to be more. AA

153

Srivastava (MK) and Chopra (S). **Cost effectiveness in packaging - use of LLDPE film for milk packing.** *Packaging India* 25(1): 1992: 17, 19, 21-23

Use of linear low density polyethylene (LLDPE) film makes the pouch filling more cost effective and the advantages of using LLDPE film in achieving lesser percentage of leakage, shorter pouch length and significant downguaging in milk packing are discussed in this article. CSA

Milk products

Cheese

154

Pagliarini (E), Lembo (P) and Bertuccioli (M). **Recent advancements in sensory analysis of cheese.** *Italian Journal of Food Science* 3(2): 1991; 85-99

Recent advancements in sensory analysis of cheese are reviewed in this paper. By analysis of the sensory characteristics of various products, a list of attributes which can be used for all production lines are suggested and presented in an easily utilizable diagram. AA

155

Stratton (JE), Hutkins (RW) and Taylor (SL). **Biogenic amines in cheese and other fermented foods: A review.** *Journal of Food Protection* 54(6): 1991: 460-470

This review focuses on the importance of histamine and biogenic amines in cheese and other fermented foods. 101 references. BV

156

Lalic (LM) and Berkovic (K). **Storage time as a factor in determining physico-chemical parameters of new cheese products.** *Acta Alimentaria* 20(1): 1991: 19-24

Changes of physico-chemical parameters have been determined for the fresh prepared samples of new products based on fresh cottage cheese, semolina and eggs with adding of NaCl, cooked chopped spinach, hot red pepper, sucrose, vanilla, sugar and cinnamon, and for the samples stored at -14°C. At definite periods of time the changes in electroconductivity values, pH values, degree of acidity and texture of the prepared and stored samples during frying, were determined as well as products were checked for homogeneity. The amount of nitrate, nitrite and Fe was established in cooked spinach and in the samples with the addition of spinach and cottage cheese amounting to the wt. share of 25%. The samples of the new products, were shaped as 40 g biscuits, packed in small LDPE folio sacks, 50 μm thick, and stored at 259 K. They were analysed after 20, 40, 60 and 70 days, having previously reached the temp. of 20°C. AA

157

Tewari (BD) and Singh (S). **Cream cheese production - A review.** *Indian Journal of Dairy Science* 44(5): 1991; 348-351

This review article highlights the trend in cheese production, its importance in dairy industry, its potential for increasing production in India, simplification of manufacturing techniques and modifications of compositional attributes to suit consumers taste. 29 references. SRA

158

Litopoulou-Tzanetaki (E) and Tzanetakis (N). **Microbiological study of white-brined cheese made from raw goat milk.** *Food Microbiology* 9(1): 1992: 13-19

Results of this study suggest that lactic acid bacteria (*Lactobacillus plantarum, Lactococcus lactis*) predominate over the other microbial groups after 15 days of cheese ripening. Low pH levels (4.5) and high NaCl content (5.8 - 6.2%) after 75 days affected the growth of most microbial groups resulting in considerably lower counts at 3 months. Heterofermentative lactic acid bacteria at low levels in starter could be used to solve non-uniform quality, flavour abnormalities and texture problems. SRA

Cheddar cheese

159

Jha (YK) and Singh (S). **Effect of higher ripening temperatures on flavour development in buffalo Cheddar cheese with and without cheese cloth.** *Indian Journal of Dairy Science* 45(6): 1992: 313-318

Higher ripening temp. accelerated flavour development in buffalo Cheddar cheese. Cheddar cheese ripened with and without cheese cloth at 8°C, 15°C for 3 wks, 15°C for 6 wks, 20°C for 3 wks and 20°C for 6 wks then transferred to 8°C for further ripening analysed for moisture losses, sensory characteristics and biochemical changes during 8 months of ripening. The moisture losses under standard conditions of curing (8°C and 78% RH) after 8 months was 4.66% which was reduced to 1.39% by paraffining cheese with cheese cloth. The moisture loss in cheese samples with and without cheese cloth ranged from 4.66 to 6.36% and 1.39 to 2.62% respectively at higher ripening temp. The cheese samples paraffined with cheese cloth and ripened at 15°C for 3 wks and 6 wks then transferred to 8°C showed acceleration in flavour development over cheese samples without cheese cloth. No beneficial role of higher ripening temp. (20°C) with cheese cloth on flavour was observed. AA

160

Guinee (TP), Wilkinson (MG), Mulholland (EO) and Fox (PF). **Influence of ripening temperature, added commercial enzyme preparations and attenuated mutant (Lac$^-$) *Lactococcus lactis* starter on the proteolysis and maturation of Cheddar cheese.** *Irish Journal of Food Science and Technology* 15(1/2): 1991: 27-52

The effect of commercial enzyme preparations, in combination with freeze-shocked-lactose negative *Lactococcus lactis* subsp. *diacetylactis*, on the proteolysis, texture and flavour development in Cheddar cheeses ripened at 5, 10 or 15°C was examined over a 240-day maturation period. Enzymes, i.e. neutrase, FlavourAge-FR and lyophilized rennet (at different levels) were added to the curd at salting. Proteolysis increased with storage time and ripening temp.; of the enzymes evaluated Neutrase gave the highest levels of proteolysis as detected by N solubility in water, 75% ethanol and 5% phosphotungistic acid. FlavourAge-FR also accelerated proteolysis while increased levels of rennet gave proteolysis levels similar to those of the control cheese. The addition of the freeze-shocked mutant starter gave moderate increases in proteolysis (1-2%); a synergistic effect on proteolysis was noted between Neutrase and freeze-shocked starter. High levels of proteolysis (> 27% water soluble N), as effected by prolonged storage of cheese (> 128 days) at high temp. (> 10°C) and by the addition of Neutrase or FlavourAge-FR resulted in cheeses with defective texture (soft, brittle, adhesive) and flavour (bitter, soapy). AA

Ghee

161

Bindal (MP) and Wadhwa (BK). **Renovation of rancid ghee.** *Indian Journal of Dairy Science* 44(5): 1991: 323-326

A simple and commercially viable method to enhance the shelf-life of poor shelf-lifed renovated ghee by addition of BHA (0.02%) is described. The ghee showed a shelf-life very close to fresh ghee. SRA

Paneer

162

Rao (KVSS), Zanjad (PN) and Mathur (BN). ***Paneer* technology - a review.** *Indian Journal of Dairy Science* 45(6): 1992: 281-291

Historical perspective, methods of production (traditional process, practices in the organized sector, upgradation of existing technology, process mechanization), factors affecting the quality of *paneer* (type of milk, quality of milk, heat treatment of milk, type of coagulant, strength of coagulant, amount of coagulant required, coagulation temp., pH of coagulation) yield of *paneer*, chemical composition, physico-chemical changes during *paneer* manufacture, microbiological quality, shelf-life, preservation of *paneer*, changes in *paneer* during storage (physico-chemical and microbiological changes, nutritive value) rheology of *paneer*, microstructure of *paneer* and priorities of future research are the aspects included in this review. 54 references. SRA

163

Ashraf Pal (M) and Yadav (PL). **Effect of blending buffalo and cow milk on the physico-chemical and sensory quality of *paneer*.** *Indian Journal of Dairy Science* 44(5): 1991: 327-332

Paneer (5 batches) prepared by blending buffalo and cow milk in the proportions of 1:0, 3:1, 1:1, 1:3 and 0:1 were evaluated for their quality characteristics. The blending of buffalo and cow milk showed a significant effect ($P < 0.05$) on the % moisture, and total solids; and highly significant effect ($P < 0.01$) on fat, ash on dry matter basis of *paneer*. Other physico-chemical (protein, lactose, Ca, P, total solids recovery, coagulant amount, moisture absorption,

titratable acidity and pH), sensory and whey characteristics elicited slight variations and were statistically non-significant. The results indicate that a good quality *paneer* can be prepared by blending buffalo and cow milk upto a ratio of 1:1. SRA

Milk proteins

Caseins

164

Madhava Rao (T), Jairem (BT), Reddy (RRRK) and Laxminarayana (M). **Studies on the quality of casein incorporated rennet curd (coagulum).** *Indian Journal of Dairy Science* 44(5); 1991; 358-359

The various physical and chemical properties of protein enriched curd prepared with the addition of acid casein is reported. Results indicated that the total protein content increased from 5.66 plus or minus 0.13 to 9.66 plus or minus 0.13. Rennet coagulation time decreased from 32.50 plus or minus 2.88 at 2% level to 19.16 plus or minus 0.87 min at 6% level of casein addition to milk. Higher content of casein decreased the rennet coagulation time. Addition of casein to milk improved the physical properties. Rennet curd with 4% addition of casein was moderately protein-rich and soft natured compared to 2 and 6% additions. SRA

MEAT AND POULTRY

165

Sahu (BB) and Mahapatra (CM). **Poultry and meat processing as industry.** *Indian Food Industry* 11(1); 1992; 31-33

Aspects covered in this article are the prospects of meat processing, the industrial profile of meat food products, financing meat industry (large scale and rural), financial assistance schemes by nationalised banks and checklist for economic and technical feasibilities. CSA

Meat

Pork

166

Yen (LC), Sofos (JN) and Schmidt (GR). **Effect of meat curing ingredients on thermal destruction of *Listeria monocytogenes* in ground pork.** *Journal of Food Protection* 54(6); 1991; 408-412

Ground pork (GP) (15% fat) inoculated with a mixture of 9 strains of *L. monocytogenes* (10^7 - 10^8 CFU/g) was mixed with different levels of curing ingredients, filled into baby food jars (140 plus or minus 5 g/jar), and cooked in a waterbath to 60°C internal product temp. Heating rates were similar among meat treatments with different additives. However, destruction of *L. monocytogenes* was 3 log/g less in GP with 3% NaCl than in GP without added NaCl ($P < 0.05$). The protective effect of NaCl against destruction of *L. monocytogenes* increased with increasing (0 - 3%) NaCl concn. Dextrose (1%) and phosphate mixture (0.4%) also protected *L. monocytogenes* ($P < 0.05$) from thermal destruction. Sodium nitrite (0.0156%) and sodium erythorbate (0.055%) did not affect ($P > 0.05$) the degree of thermal destruction of *L. monocytogenes* in GP. The greatest protective effect was observed when all curing ingredients were combined and added in GP. These results indicated that the chance for *L. monocytogenes* to survive during heat processing is greater in cured than in fresh meat. AA

Products

167

Hung (SC) and Zayas (JF). **Sensory, chemical and bacteriological stability of frankfurters containing milk proteins and corn germ protein flour.** *Journal of Food Processing Preservation* 15(6); 1991; 413-431

168

Giese (J). **Developing low-fat meat products.** *Food Technology* 46(4); 1992; 100-108

A var. of techniques adopted to reduce or replace fat in making low-fat meat products (low-fat patties, sausages and frankfurters) are discussed. The cooking methods, effect of grind size, binders (carrageenan, soy proteins, oat bran, oat fiber, functional blends, maltodextrins and plant oil) and the additional ingredients (encapsulated salt and flavours) used in the development of low-fat patties and the mechanical methods used for removing fat and cholesterol (supercritical fluid extraction, separation process and microwave cooking pads) are explained. CSA

Frankfurters

169

Buncic (S), Paunovic (L) and Radisic (D). **The fate of *Listeria monocytogenes* in fermented sausages and in vacuum-packaged frankfurters.** *Journal of Food Protection* 54(6); 1991; 413-417

In inoculated fermented sausages, the initial "most probable number" (MPN) of *L. monocytogenes* decreased from 8 x 10^6/g to 1.1 x 10^4/g during the production process. When the initial MPN was 6.5 x 10^2/g, *L. monocytogenes* were detected in finished sausages only when 25-g samples were used. The MPN of *L. monocytogenes* in finished experimental sausages remained constant during 20 days of storage at room temp. The av. number of lactobacilli in the experimental sausages was initially 1.2 x 10^7/g, reached 8 x 10^7/g after ripening, and decreased to 2.2 x 10^7/g in finished sausages. Sterilized filtrates of 12 *Lactobacillus plantarum* broth cultures produced zones of inhibition of *L. monocytogenes* growth on solid medium, when the pH of the filtrates ranged from 3.47 to 4.52. When the pH of the same filtrates was adjusted to 7.0, only slight zones of inhibition were registered with filtrates of 7 out of the 12 *L. plantarum* strains examined. In vacuum packages of surface-contaminated frankfurters, the MPN of *L. monocytogenes* increased from 5 x 10^2 to 2.1 x 10^5 per package during 20 days of storage at 4°C. In the same packages, the number of lactobacilli increased from 2.4 x 10^5 to 6.6 x 10^9 per package. AA

Poultry

170

Zeitoun (AAM) and Debevere (JM). **Inhibition, survival and growth of *Listeria monocytogenes* on poultry as influenced by buffered lactic acid treatment and modified atmosphere packaging.** *International Journal of Food Microbiology* 14(2): 1991: 161-170

The effect of the treatment with various concn. (2, 5 and 10% w/v) of lactic acid/sodium lactate buffer (pH 3.0), modified atmo. packaging (MAP) (90% CO_2 and 10% O_2) and 10% (w/v) lactic acid/sodium lactate buffer (pH 3.0) combined with MAP on *L. monocytogenes* Z7 serotype 1 and on the shelf-life of chicken legs stored at 6°C was investigated. The initial contamination level of *L. monocytogenes* on the chicken legs surface was 8.3 x 10^2 cfu/cm^2 of skin. After 2 days of storage at 6°C the number of *L. monocytogenes* on legs treated with 2%, 5%, 10% lactic acid/sodium lactate buffer (pH 3.0) and 10% lactic acid/sodium lactate buffer (pH 3.0) combined with MAP was significantly lower than the initial number of *L. monocytogenes*. Later, growth of *L. monocytogenes* was observed. After 13 days of storage at 6°C the number of *L. monocytogenes* on legs treated with 10% lactic acid/sodium lactate buffer (pH 3.0) combined with MAP was still similar to the initial number. Legs treated with 2%, 5%, 10% lactic acid/sodium lactate buffer (pH 3.0), MAP and 10% lactic acid/sodium lactate buffer (pH 3.0) combined with MAP, have a shelf-life at 6°C of respectively 8, 9, 10, 13 and 17 days. This means a prolongation of 2, 3, 4, 7 and 11 days, respectively for storage at 6°C. The antimicrobial effect of lactic acid buffer systems (pH 3.0) increased with increasing concn. of lactic acid in the buffered system. The best results were obtained by the combined use of 10% acid/sodium lactate buffer (pH 3.0) and MAP. AA

Products

Eggs

171

Germs (AC). **Decrease in lecithin-P_2O_5 (egg yolk) content in industrially prepared egg noodles.** *Deutsche Lebensmittel-Rundschau* 87(10): 1991: 320-323

A significant (> 20%) decrease in lecithin-P_2O_5 content in egg noodles during long-term storage was observed in only one out of 9 samples from different Western European countries and China, analysed by the *Juckenack* and the Dutch Noodle Order methods. Autoxidation of lecithin did not occur during production and storage, at least complex formation with protein or carbohydrates could not be demonstrated. Apparently, the high stability of egg yolk towards lipid oxidation, is maintained during normal production of egg noodles. Precooking of egg noodles might induce a decrease in lecithin-P_2O_5 content due to an interaction of lecithin with wheat starch. The high drying temp. currently employed in egg noodle production, probably prevent enzymatic degradation of lecithin during storage. However, some degradation during production still seems possible. AA

SEAFOODS

Shrimps

172

Civera (T) and Parisi (E). **The use of sodium dodecyl sulphate polyacrylamide gel electrophoresis for the identification of raw and cooked shrimps and crabs.** *Italian Journal of Food Science* 3(2): 1991: 149-157

The effectiveness, reliability and limits of sodium dodecyl sulphate polyacrylamide gel electrophoresis for the sp. identification of raw and cooked crustacean sp., were evaluated. Several shrimp, prawn and crab samples were heated from 60 to 121°C and then analysed. The method was reliable for the identification of raw and cooked sp. treated up to 100°C, whereas most of the protein bands disappeared in canned seafoods. In cooked seafood,

sp. identification was performed using protein bands whose mol. wt. was no higher than 30 kiloDaltons. This procedure is particularly useful for pasteurized products. AA

Fish

Salmon

173

Rorvik (LM), Yndestad (M) and Skjerve (E). **Growth of *Listeria monocytogenes* in vacuum-packed, smoked salmon, during storage at 4°C.** *International Journal of Food Microbiology* 14(2): 1991: 111-118

Samples of smoked salmon of different hygienic quality were inoculated with low (6 cfu/g) and high (600 cfu/g) levels of a mixture of 3 strains of *L. monocytogenes*, after which they were vacuum-packed and stored at 4°C for up to 5 wks. *L. monocytogenes* grew well during storage in all the inoculated sample groups. Growth was, however, slightly faster in the fish with the better hygienic quality. The smoked salmon was still sensorically acceptable after 4 wks. All 3 strains were found after 4 wks in the fish with the better quality, while only 2 strains were recovered after the same time from the poorer quality salmon. AA

Products

Fish

174

Venugopal (V), Ghadi (SV) and Nair (PM). **Value added products from low-cost fish mince.** *ASEAN Food Journal* 7(1): 1992: 3-12

Briefly reviews the raw material, shelf-life, minced meat production by mechanical deboning, properties of minced meat, application of fish mince (traditional products, fish flour, fish protein hydrolysates, fermented products, fabricated foods - surimi and surimi-based products), extrusion cooked products, benefits of biotechnological applications, and industrial prospects. 103 references. SRA

Crackers

175

Yu (SY). ***Oreochromis mossambicus* in fish crackers ('*Keropok*').** *ASEAN Food Journal* 7(1): 1992: 51

The combinations of *Oreochromis mossambicus* (a cheap fresh water fish species in Southeast Asia) to *Rastrelliger kanagurta* in '*Keropok*' fish crackers (popular snack food in ASEAN) were analysed for sensory quality, moisture, protein, fat and ash contents. The % linear expansion was also calculated. '*Keropok*' was acceptable upto a level of 60% substitution of *R. kanagurta* with *O. mossambicus*. Colour, crispness, flavour and overall acceptability were not significantly different. Above 60% level, acceptability of '*keropok*' declined and scores obtained were significantly different for colour, flavour and overall acceptability. '*Keropok*' containing increased levels of *O. mossambicus* showed higher protein content. No significant difference was observed for moisture, fat and ash contents. SRA

Fish oil

176

Anon. **Fish oil consumption influences mortality rates of mice challenged with *Salmonella typhimurium*.** *Nutrition Reviews* 50(6): 1992: 173-175

PROTEIN FOODS

Nil

ALCOHOLIC AND NON-ALCOHOLIC BEVERAGES

Alcoholic beverages

Beer

177

Simpson (WJ), Fernandez (JL) and Hammond (RM). **Differentiation of brewery yeasts using a disc-diffusion test.** *Journal of the Institute of Brewing* 98(1): 1992: 33-36

A simple test, based on the inhibitory effect of a range of compounds (cycloheximide, rhodamine 6G, brillant green, 2, 3, 5 triphenyl tetrazolium chloride, ethidium bromide, Janus green) towards microorganisms, can be used to discriminate between brewery and brewery-associated yeast strains. Commercially available test discs are used for the tests but the manufacturers' conditions are modified to suit the growth requirements of brewery strains. The test is easy to perform and yields reproducible results. AA

178

Daoud (IS) and Kusinski (S). **Liquid CO_2 and ethanol extraction of hops. Part I: Effect of hop deterioration on extraction efficiency and extract quality.** *Journal of the Institute of Brewing* 98(1): 1992: 37-41

Wines

179

Mateo (JJ), Jimenez (M), Huerta (T) and Pastor (A). **Contribution of different yeasts isolated from musts of Monastrell grapes to the aroma of wine.** *International Journal of Food Microbiology* 14(2): 1991: 153-160

Volatile substances of wines obtained by fermentation of musts from 'Monastrell' grapes (Alicante, Spain) was studied for yeast isolated from such musts. The results of the statistical treatment performed show that importance of yeasts of low fermentative power, particularly *Kloeckera apiculata*, in the production of volatile substances. *Saccharomyces cerevisiae* var. *chevalieri* was found to be the most important yeast of high fermentative power. AA

180

Peri (C), Malgarini (G), De Paola (M) and Pagliarini (E). **Deep-bed filtration of wine. I. Development of a novel experimental methodology.** *Italian Journal of Food Science* 3(2): 1991: 127-136

A novel bench-scale apparatus and an experimental procedure based on the evaluation of filtration curves under standard conditions and particle retention profiles in filter-aid precoats were set up to allow a more accurate study of deep-bed filtration to be made. By adding various clouding materials to a white-wine ultrafiltration-permeate, a series of filtration exp. was carried out using fine and coarse Kieselguhr precoats, both as such and as a 1:1 mixture. By determining the retention profiles it was possible to add valuable information to permeability and turbidity retention data. Moreover, surface and in-depth fouling phenomena, as well as particle bridging or plugging at critical pore size, were clearly pointed out. AA

181

Malgarini (G), De Paola (M), Pagliarini (E) and Peri (C). **Deep-bed filtration of wine. II. Modelling and optimisation of filtration rate.** *Italian Journal of Food Science* 3(2): 1991: 137-148

Precoat filtration exp. carried out on wines with different turbidities showed that there is a turbidity threshold beyond which bridging phenomena take place and permeability becomes almost independent of sample turbidity. Only below this threshold do particles penetrate into the precoat, thus reducing plugging effects and sharply increasing into the precoat; thus reducing plugging effects and sharply increasing filter permeability. The detn. of retention profiles exhibited that the mechanism for particle capture depends upon both porosity of the filter and concn. of particles. Isotropic precoats with uniform porosity were found to be less efficient than anisotropic ones with a porosity gradient, especially when pore size decreased in the same direction of the filtrate flow (open side up). The wine filtration data were then fitted by using different kinetic equations (the cake filtration equation, the "power" equation and 3 equations relative to complete, intermediate and standard blocking). It was found that the "power" and "standard blocking" equations reconstructed the experimental data with the same degree of precision, regardless of the blocking mechanisms occurring in the filter medium. AA

Non-alcoholic beverages

Coffee

182

Cepeda (A), Paseiro (P), Simal (J) and Rodriguez (JL). **Contribution to spectrophotometry UV determination of caffeine in different types of coffees. I. Greens coffees and natural roasted coffees.** *Anales de Bromatologia* 42(2): 1990: 241-249 (Es)

A new UV spectrophotometry method for the detn. of caffeine contents in green grains and natural roasted coffee has been developed. Samples were clarified with light magnesium oxide. Extraction and purification were made using Sep Pak C18 cartridges. This method is simple, and rapid (in relation to AOAC Micro Bailey-Andrew method) and it is also reliable. It shows < 0.5 Cv%. Recovering average was 100%. It has also been studied the problem of background interferences resolution by the Morton and Stubb method and the second derivative method. The results agreed with those obtained by using Micro Bailey-Andrew method (AOAC). AA

183

Anon. **Regular or decaf? Coffee consumption and serum lipoproteins.** *Nutrition Reviews* 50(6): 1992: 175-178

Reviews the potential impact of caffeinated vs decaffeinated coffee on serum lipids. 19 references. GS

Fruit juices

184

Crivaro (NO) and Fabeiro (MDC). **Determination of colouring matters in fruit juices and derivatives beverages. I. Quantitative analysis of Naranja A-1 (Food Yellow 3, E-110).** *Anales de Bromatologia* 42(2): 1990: 227-240 (Es)

185

Sapers (GM). **Control of enzymatic browning in raw fruit juice by filtration and centrifugation.** *Journal of Food Processing Preservation* 15(6): 1991: 443-456

Centrifugation at lower speed prevented browning in pear juice and apple (Granny Smith, Golden Delicious, Red Delicious) juice provided the foam was excluded. A method of preparation of non-browning cludy apple juice by recombining heat-treated juice particulates with juice supernatant or ultrafiltration permeate is discussed. SD

Cherry juices.

186

Sahin (S) and Bayindirli (L). **Assessment of the exponential model to sour cherry juice filtrations.** *Journal of Food Processing Preservation* 15(6): 1991: 403-411

Wine filtration (De La Garza and Boulton's model) simulated the data in the cake filtration of sour cherry juice. There was negative relation between filtration rate and resistance, forecasting and filtration rate and positive relation between filter aid dose and filtration rate. SD

Grapefruit juices

187

Nagy (S), Rouseff (RL), Fisher (JF) and Lee (HS). **HPLC separation and spectral characterization of browning pigments from white grapefruit juice stored in glass and cans.** *Journal of Agricultural and Food Chemistry* 40(1): 1992: 27-31

A ternary solvent system consisting of water, acetonitrile, and tetrahydrofuran was used in HPLC to separate browning pigments formed in grapefruit juice stored in cans and bottles. Pigments were spectrophotometrically characterized using a photodiode array detector. HPLC runs evaluated at various storage times manifested different browning patterns with both the canned and bottled juices. Some compounds increased and then decayed with time, whereas others continued to intensify. Late eluting components (Rt > 80 min) were the most nonpolar browning pigments and, also, showed the most consistent HPLC patterns. HPLC patterns, retention times, and UV-vis spectra of browning components in canned juices were notably different from those of glass-packed juices. Most of the separated compounds exhibited absorbance maxima in the region 380 - 400 nm, and a value of 390 nm was ascertained by averaging all visible-absorbing maximums. No browning pigment had a distinct absorbance above 400 nm. The use of 390 nm to monitor nonenzymic browning of grapefruit juice is more appropriate than the current accepted value of 420 nm. AA

188

Crivaro (NO). **Determination of colouring matters in fruit juices and derivatives beverages. II. Quantitative analysis of tartrazine (E 120) in grapefruit beverages.** *Anales de Bromatologia* 42(2): 1990: 287-298 (Es)

Orange juices

189

Crivaro (NO). **Determination of colouring matters in fruit juices and derivatives beverages. III. Quantitative analysis of both Naranja A-1 (Sunset Yellow FCF, E-110) and tartrazine (E-102) mixed in orange beverag.es.** *Anales de Bromatologia* 42(2): 1990: 377-391 (Es)

Pineapple juices

190

Krueger (DA), Krueger (R-G) and Maciel (J). **Composition of pineapple juice.** *Journal of AOAC International* 75(2): 1992: 280-282

Some of the analytical data on the composition of pineapple juice is presented. Major and some minor constituents were determined for a series of fresh pineapple juices. Results include: soluble solids 11.2 - 16.2 g/100g, acidity (citric acid) 0.46 - 1.21 g citric acid/100 ml, fructose 1.72 - 4.75 g/100 ml, glucose 1.21 - 4.52 g/100 ml, sucrose 2.47 - 9.73 g/100 ml, citric acid 0.439 - 1.151 g/100 ml, malic acid 0.073 - 0.391, isocitric acid 80 - 265 mg/l, potassium 830 - 1410 mg/l, formol value 0.74 - 1.69 meq/100 ml, proline 11 - 44 mg/l, and carbon isotope ratio 13.5 - 11.2% PDB. Use of these compositional values in the detection of adulterated pineapple juice is discussed. BV

191

Desrosiers (T) and Clydesdale (FM). **Zinc and calcium solubility from instant tea and coffee with and without the addition of milk.** *Journal of Food Protection* 54(6): 1991: 451-453

The effect of tea and coffee, with and without milk, on the solubility of added Zn and Ca after a sequential pH change to 2 and 6 was investigated. The addition of milk did not decrease the solubility of endogenous Zn and Ca in tea but did in coffee. Liquid tea decreased ($P < 0.01$) the solubility of added Zn but not of added Ca. However, the addition of milk to tea containing added Zn and Ca decreased ($P < 0.01$) the solubility of both elements. This decrease reached a plateau after 100 or 150 ml of milk was added to 100 or 50 ml of tea, respectively. In coffee, when the minerals were added, the solubility of Zn did not depend on the presence of milk, whereas, the solubility of Ca decreased proportionally to the amount of milk added ($P < 0.05$). AA

FATS AND OILS

192

Addo (K) and Pomeranz (Y). **Effects of lipids and emulsifiers on alveograph characteristics.** *Cereal Chemistry* 69(1): 1992: 6-12

The effects of lipids from hard red winter, durum, and commercial soft white winter flours of 12.9, 12.2 and 8.9% protein, respectively, on alveograph rheological dough properties of petroleum-ether (PE) defatted flours were determined. Alveograph parameters, significantly affected by PE defatting, could be restored by reconstitution of the flours. The source of flour lipids had no effect on the properties of reconstituted doughs. Defatting increased alveogaph parameters P, W and DM and decreased L. Adding 2 or 4 times the amounts of free (PE-extracted) flour lipids beyond the level found in the original flour resulted in slight changes in alveograph characteristics of the reconstituted flour. Nonpolar lipids from the original flour, shortening (at a 2% level), linoleic acid, and (to a limited extent) linolenic acid were more effective in restoring alveograph characteristics of the defatted flour than were polar wheat flour lipids; corn, peanut, and palm oils; and palmitic, stearic, and oleic acids. Adding 2% shortening in combination with 0.2% lecithin, 0.2% hydroxylated lecithin, or 0.1% ethoxylated monoglycerides to the defatted flour made the doughs more similar in rheological properties to the original flour than adding shortening alone. AA

193

Elsner (A), Mieth (G) and Engst (W). **Sucrose fatty acid polyesters: Motives, possibilities and limits of application as fat substitutes in foods.** *Ernahrungsforschung* 36(4): 1991: 126-132 (De)

The aim of the application of fat substitutes in high-caloric foods is the preventive and therapeutic effect on food-related diseases, in particular diseases of the coronary and cerebrovascular system. The large number of possible fat substitutes consists of native, digestible non-lipidic compounds with low energy value on the one hand, and synthetic, lipid-like non-digestible and therefore non-caloric compounds on the basis of fatty acid esters and ethers of polyols or polycarboxylic acids on the other. Among the pseudofats sucrose fatty acid polyesters are preferred because they may be synthesized according to the demands of food processing. Additionally, the properties can be varied, and biochemical behaviour is cleared up in principle. AA

194

El-Shattory (Y), Hegazy (S), Soliman (MM) and Aly (SM). **Heated fats. Part 3. Biological effect and effect of heating and tempering oils on fatty acid composition of liver, heart and serum lipids of rats.** *Die Nahrung* 35(10): 1991: 1007-1012

The results showed that the heated oils were generally more damaging to the organs of the rats than fresh fats. BV

195

Rohm (H) and Raaber (S). **Hedonic spreadability optima of selected edible fats.** *Journal of Sensory Studies* 6(2): 1991: 81-88

An untrained 33 students panel gave their hedonic preference to spreadability of butter, margarine, low fat products at different temp. Haake Kon consistometer measured cone penetration yield values under constant load. The results indicated that the preferred spreadability corresponded to 30 - 60 kPa yield value irrespective of the products. SD

196

Gopala Krishna (AG) and Prabhakar (JV). **Effect of water activity on secondary products formation in autoxidizing methyl linoleate.** *Journal of the American Oil Chemist's Society* 69(2): 1992: 178-183

The role of a_w on the formation of peroxides and carbonyl compounds during lipid oxidation is

important to know because there could be either beneficial or detrimental effects of a_w on lipid oxidation in stored foods. Therefore, methyl linoleate was chosen as a model lipid and was autoxidized to 1% at a_w ranging from 0.02 to 0.79 at 37°C. Oxygen uptake was monitored manometrically. The peroxide and carbonyl contents were determined upon termination of the autoxidation studies. Methyl linoleate autoxidation was characterized by three phases: i) an intial induction period of no oxygen absorption; ii) a slow rate of oxygen absorption, upto 0.15% oxidation; and iii) a relatively faster rate of oxygen absorption beyond 0.15% upto 1% oxidation. a_w had considerable influence during the first phase. There was no induction period at or below a_w 0.22. The induction period begins at a_w 0.32 and could be extended to a limit with increase in a_w. Once the induction period was passed a_w had no influence on the rate of oxidation. However, during the second and third phases a_w becomes important in the stabilization of peroxides/hydroperoxides and decides the course of secondary reactions that follow peroxide decomposition. Higher a_w values, particularly a_w 0.67, tended to stabilize peroxides. a_w had considerable influence on the formation of secondary products of autoxidation as evidenced by the variation in the type and quantity of carbonyl compounds at different a_w values. AA

197

Brulin (CM), Cotter (A), Diaz-Knauf (K), Sutherlin (J), West (E), Wightman (N), Williamson (E), Yaffee (M). **Consumer attitudes and market potential for foods using fat substitutes.** *Food Technology* 46(4): 1992: 81-82, 84, 86

Information on consumers' perception of high-fat foods and their attitudes toward lower-fat foods which incorporate fat substitutes (simplesse or olestra) is presented in this article. CSA

Oils

198

Ledahudec (J) and Pokorny (J). **Effect of free fatty acids on the flavour of frying oil.** *Die Nahrung* 35(10): 1991: 1071-1075

Lauric acid imparts soapy taste to edible oil and to fried bread in the concn. of < $g.kg^{-1}$, palamitic acid and stearic acid taste neutral in the concn. of upto 20 $g.Kg^{-1}$ oleic acid is neutral in the same concn. range, while purified linoleic acid tastes slightly bitter, and the flavour of linolenic acid is bitter and rancid at the concn. of 1 $g.kg^{-1}$. AA

199

Ratnayake (WMN) and Pelletier (G). **Positional and geometrical isomers of linoleic acid in partially hydrogenated oils.** *Journal of the American Oil Chemist's Society* 69(2): 1992: 95-105

The geometrical and positional isomers of linoleic acid of a partially hydrogenated canola oil-based spread were isolated and identified. Through partial hydrazine reduction and mass spectral studies, *cis*-9, *trans*-13 octadecadienoic acid was identified as the major isomer. Other quantitatively important isomers characterized were *cis*-9, *trans*-9, *cis*-12 and *cis*-9, *cis*-15. These 4 were also the major isomers in margarine based on common vegetable oils. A number of minor isomers were detected and some structures identified were *trans*-9,*trans*-12; *trans*-8,*cis*-12; *trans*-8,*cis*-13; *cis*-8,*cis*-13; *trans*-9,*cis*-15; *trans*-10,*cis*-15 and *cis*-9,*cis*-13. The proportions of the various isomers are given for some margarines in the Canadian retail market. The amounts of *trans*-9,*trans*-12 isomer in Canadian margarines were generally below 0.5% of the total fatty acids. AA

200

Yoshida (H), Tatsumi (M) and Kajimoto (G). **Influence of fatty acids on the tocopherol stability in vegetable oils during microwave heating.** *Journal of the American Oil Chemist's Society* 69(2): 1992: 119-125

Effects of 0, 0.05, 0.25, 0.50 and 1.0% levels of fatty acids (caproic, caprylic, capric and lauric) or hydrocarbons (decane and dodecane) on tocopherol stability in vegetable oils during microwave heating were determined by measuring tocopherol losses and carbonyl and anisidine values. The fatty acids showed similar prooxidant activities toward tocopherols in purified vegetable oils when heated in a microwave oven. However, decane or dodecane, which had the same number of carbons as capric or lauric acid but no carboxylic group, did not show prooxidant activity. The shorter the chainlength and the higher the level of fatty acids, the greater was the reduction of tocopherols in the oils. The addition of low-mol. wt. fatty acids resulted in greater acceleration in the oxidation of tocopherols in the oils. The addition of low-mol. wt. fatty acids resulted in greater acceleration in the oxidation of tocopherols in the purified oils. Therefore, it is necessary to pay attention to these free fatty acids produced in the oils when heated in a microwave oven. AA

201

Forssell (P), Kervinen (R), Lappi (M), Linko (P), Suortti (T), Poutanen (K). **Effect of enzymatic interesterification on the melting point of**

tallow-rapeseed oil (LEAR) mixture. *Journal of the American Oil Chemist's Society* 69(2): 1992: 126-129

To reduce the melting point of a tallow-rapeseed oil mixture, the triglyceride composition of the mixture was altered by enzymatic interesterification in a solvent-free system. The interesterification and hydrolysis were followed by melting point profiles and by free fatty acid detn. The degree of hydrolysis was linearly related to the initial water content of the reaction mixture. The rate of the interesterification reaction was influenced by the amount of enzyme but not much by temp. between 50 and 70°C. The melting point reduction achieved by interesterification depended on the mass fractions of the substrates: the lower the mass fraction of tallow, the larger the reduction of the melting point. AA

202

Chong (CN), Hoh (YM) and Wang (CW). **Fractionation procedures for obtaining cocoa butter-like fat from enzymatically interesterified palm olein.** *Journal of the American Oil Chemist's Society* 69(2): 1992: 137-140

Solvent-free lipase-catalyzed incorporation stearic acid in palm olein by the 1,3-regiospecific Novo Lipase Lipozyme IM20 resulted in the formation of a complex mixture of fatty acid glycerides and free fatty acids. The stearoyl incorporation in palm olein gave rise to the formation of 39.3% of the desired cocoa butter-like triglycerides in the fatty acid glyceride portion, namely distearoyl-oleoyl-glycerol (SOS), palmitoyl-oleoyl-stearoyl-glycerol (POS) and dipalmitoyl-oleoyl-glycerol (POP). A combination of fractionation steps involving initially the removal of free fatty acids (FFA) from the product mixture by steam distillation under vacuum, followed by fractional crystallization of the fatty acid-free glycerides in hexane and/or acetone, gave a fat, whose triglyceride composition and melting profile were comparable to that of cocoa butter as adduced by RP-HPLC and differential scanning calorimetry. The yield of the cocoa butter-like fat was approx. 25% of the wt. of the original palm olein. AA

203

Schwartz (DP) and Rady (AH). **Quantitation and occurrence of hydroxy fatty acids in fats and oils.** *Journal of the American Oil Chemist's Society* 69(2): 1992: 170-173

A relatively simple method is detailed for the routine quantitation and isolation of hydroxy fatty acid (HFA) in the glycerides of lipids. The lipid in cyclohexane is transmethylated in a 2-phase, 3.5 min procedure, and the hydroxyl compounds in the methyl ester fraction are derivatized with pyruvic acid chloride 2,6-dinitrophenyl-hydrazone in the presence of triethylenediamine. The derivatives are fractionated on alumina, and the HFA fraction is evaluated spectrophotometrically. A large var. of animal, plant and marine lipids contains HFA in concn. ranging from < 10 to > 1000 μmoles/g lipid. The derivatives lend themselves admirably to purification techniques. A procedure for regenerating the parent HFA from the derivative is described. AA

204

Ratnayake (WMN). **AOCS method Ce 1c-89 underestimates the *trans*-octadecenoate content in favour of the *cis* isomers in partially hydrogenated vegetable oils.** *Journal of the American Oil Chemist's Society* 69(2): 1992: 192

205

Boki (K), Kubo (M), Wada (T) and Tamura (T). **Bleaching of alkali-refined vegetable oils with clay minerals.** *Journal of the American Oil Chemist's Society* 69(3): 1992: 232-236

The sepiolites (powder and spherule, Turkish origin) with more acid sites at -5.6 > H_o greater than or equal to -3.0 were the most effective in bleaching of each alkali-refined oil (rapeseed, soybean, wheat germ, safflower, corn, cottonseed and sunflower). Surface area and acidity at -5.6 > H_o greater than or equal to -3.0 were highly significant with bleaching efficiency. The sepiolites were more suitable than standard activated clay because they were more effective both in retaining tocopherols and in reducing free fatty acids after bleaching. BV

206

Elson (CE). **Tropical oils: Nutritional and scientific issues.** *CRC Critical Reviews in Food Science and Nutrition* 31(1/2): 1992: 79-102

Aspects covered in this review are: the influence of palm oil on sterol metabolism (human and animal), thrombus formation and experimental carcinogenesis role of triglyceride structure, influence of minor constituents of palm oil on sterol metabolism and experimental carcinogenesis. 180 references. BV

Coconut oils

207

Man (YC), Suhardiyono, Asbi Ali and Mohd Nasir Azudin. **Acetic acid treatment of coconut cream in coconut oil extraction.** *ASEAN Food Journal* 7(1): 1992: 38-42

Significant destabilization of the cream from coconut milk was obtained with 0.4% of 25% acetic acid treatment compared with lower levels (0.1 - 0.3%). The reaction times of acid treatment also affected the process. Recovery of oil (58 - 61%) was higher than the 30 - 40% obtained from traditional wet processing or the 50% reported for the Royal Tropical Institute of Amsterdam method. This alternative technique for removing oil from coconut meat, involving the use of acetic acid, is an improvement over traditional wet processing methods. SRA

Palm oils

208

Krisnangkura (K) and Simamaharnnop (R). **Continuous transmethylation of palm oil in an organic solvent.** *Journal of the American Oil Chemist's Society* 69(2): 1992: 166-169

Palm oil was transmethylated continuously at 70°C in an organic solvent with sodium methoxide as a catalyst. The optimum ratio of toluene to palm oil is 1:1 (v/v). When the methanol-to-oil molar ratio was 13:1, transmethylation was 96% complete within 60 sec. At higher molar ratio (17:1), transmethylation was 99% complete in 15 sec. For lower molar ratios of methanol-to-oil (9:1 and 5.8:1), yields of palm oil methyl ester (POME) were 84 and 58%, respectively. Benzene was also a good solvent for transmethylation, but the yield of POME was slightly lower than toluene. Tetrahydrofuran did not accelerate transmethylation. AA

209

Idris (NA), Abdullah (A) and Halim (AH). **Evaluation of palm oil quality: Correlating sensory with chemical analyses.** *Journal of the American Oil Chemist's Society* 69(3): 1992: 272-275

Palm oils of various qualities were used in this study. Chemical analyses included detn. of free fatty acids, peroxide value and *p*-anisidine value. Sensory evaluations included scoring and descriptive tests. Fresh, crude palm oil of high quality with a max. score showed a zero peroxide value, a zero *p*-anisidine value and a free fatty acid level of 0.2%. It had a strong, pleasant, sweet caramel-like flavour. The levels of free fatty acids were higher in samples that had been stored for a long time. Their *p*-anisidine values were also higher compared to fresh oils. Flavour intensity of red palm oil did not necessarily indicate quality. Its quality was dependent on the type of flavour, pleasant or otherwise. For refined, bleached and deodorized oil, there was an inverse relationship between flavour intensity and quality with a correlation coeff. of r = -0.87. There was some correlation between overall rating by sensory method and quality evaluation by chemical analyses, such as free fatty acids (r = -0.69), peroxide value (r = -0.57) and *p*-anisidine value (r = -0.49). AA

210

Ho (CC), Chow (MC) and Ong (SH). **Recovery of residual oil from the centrifuge sludge of a palm oil mill: Effect of enzyme digestion and surfactant treatment.** *Journal of the American Oil Chemist's Society* 69(3): 1992: 276-282

Residual oil recovery from the centrifuge sludge of a palm oil mill was investigated by treating with enzyme (Celluclast) followed by washing the digested substrate with surfactant. The optimal conditions for enzyme digestion with respect to pH, temp., reaction time, concn. of enzyme and surfactant were evaluated. The possible role of the surfactant in the oil recovery process is discussed. The chemical composition and physical properties of the sludge before and after treatment were determined and its significance in the subsequent effluent treatment/utilization of the suldge is discussed. AA

211

George (S) and Arumughan (C). **Lipid profile of process streams of palm oil mill.** *Journal of the American Oil Chemist's Society* 69(3): 1992: 283-287

During palm oil extraction, oil loss occurs mainly at 3 stages of processing, namely sterilization, pressing and clarification. Samples from a semi-commercial palm oil mill were analyzed for their lipid composition (triglycerol, diaacylglycerol, monoacylglycerol, free fatty acid, phospholipid and glycolipid contents and fatty acid compositions of these lipid classes) and compared with the end product, viz., raw palm oil. The results indicate significant variations between the samples with respect to oil quality and lipid profile. Data relating to the lipid classes showed that sterilizer condensate had the highest levels of free fatty acids (24%), followed by press fiber (12.5%) and sludge effluent (10.9%), as compared to raw oil (1.5%). Diacylglycerol and monoacylglycerol contents were also markedly higher for these streams. Press fiber was characterized by extremely high proportions of phospholipids and glycolipids. Distribution of fatty acids (16:0, 18:1, 18:2 and 18:3) also varied among lipid classes of the process streams, particularly between polar lipids. This paper discusses the compositional aspects of lipids relating to quality of oils of the palm oil mill streams. AA

Sesame oils

212

Mukhopadhyay (SB), Gupta (PK) and Basu (AK). **Dry refining of sesame oil with alkali-enriched sodium metasilicate.** *Journal of the American Oil Chemist's Society* 69(3): 1992: 294

An easy method of refining sesame oil with alkali-enriched dry sodium metasilicate (SMS) is described. A significant reduction in free fatty acids (FFA) of the oil is observed. The extent of FFA reduction depends on the degree of the alkalinity of SMS-NaOH mixture. The method could be used for readily preparing low-FFA, medium-colour triglyceride oils that may find applications where the colour of final products does not pose a problem. BV

Soybean oils

213

Neff (WE), Selke (E), Mounts (TL), Rinsch (W), Frankel (EN), Zeitoun (MAM). **Effect of triacylglycerol composition and structures on oxidative stability of oils from selected soybean germplasm.** *Journal of the American Oil Chemist's Society* 69(2): 1992: 111-118

The oxidative stability of soybean oil triacylglycerols was studied with respect to composition and structure. Crude soybean oils of various fatty acid and triacylglycerol composition, hexane-extracted from ground beans, were chromatographed to remove non-triacylglycerol components. Purified triacylglycerols were oxidized at 60°C, in air, in the dark. The oxidative stability or resistance of the substrate to reaction with oxygen was measured by detn. of peroxide value and headspace analysis of volatiles of the oxidized triacylglycerols (at < 1% oxidation). The correlation coeff. (r) for rates of peroxide formation (r = 0.85) and total headspace volatiles (r = 0.87) were related positively to oxidizability. Rate of peroxide formation showed a positive correlation with average number of double bonds (r = 0.81), linoleic acid (r = 0.63), linolenic acid (r = 0.85). Rate of peroxide formation also showed a positive correlation with linoleic acid (r = 0.72) at the 2-position of the glycerol moiety. A negative correlation was observed between rate of peroxide formation and oleic acid (r = -0.82). Resistance of soybean triacylglycerols to reaction with oxygen was decreased by linolenic (r = 0.87) and increased by oleic acid (r = -0.76) containing triacylglycerols. Volatile formation was increased by increased concn. of linolenic acid at exterior glycerol carbons 1,3 and linoleic acid at the interior carbon 2. Headspace analysis of volatiles and HPLC of hydroperoxides indicated that as oxidation proceeded there was a slight decrease in the linolenic acid-derived hydroperoxides and an increase in the linoleic acid-derived hydroperoxides. The oxidative stability of soybean oil triacylglycerols with respect to composition and structure is of interest to the development of soybean varieties with oils of improved odour and flaour stability. AA

214

Nourooz-Zadeh (J) and Appleqvist (L-A). **Isolation and quantitative determination of sterol oxides in plant-based foods: Soybean oil and wheat flour.** *Journal of the American Oil Chemist's Society* 69(3): 1992: 288-293

Soybean oil and wheat flour were analyzed for the content of sitosterol oxides. The method involved chromatography on a Lipidex-5000 column and enrichment on a disposable NH_2-column, yielding a sterol fraction and a sterol oxide fraction. Each fraction was separated as trimethylsilyl-ethers on a methyl silicone capillary column. Analysis of crude and freshly refined soybean oil showed no detectable levels of the isomeric 5,6-epoxysitosterols, the epimeric 7-hydroxysitosterols and 5,6-dihydroxysitosterol at the detection limit of 0.2 p.p.m. Storage of a refined soybean oil for 1 yr at 4°C caused no significant increase in the level of free sitosterol oxides when compared to the freshly refined soybean oil. Analysis of 3 wheat flours (at 2, 8 and 36 months) revealed that the samples contained variable levels of 5α,6α-epoxysitosterol (5.4 - 55 p.p.m. in the lipids), 5β,6β-epoxysitosterol (0.2 - 29 p.p.m.), 7α-hydroxysitosterol (9.3 - 118 p.p.m.) and 7β-hydroxysitosterol (9.7 - 126 p.p.m.). AA

SPICES AND CONDIMENTS

Spices

Coriandrum

215

Adhikari (S), Huq (F), Monowara Begum and Saha (G). **Studies on *Coriandrum sativum* Linn. Part II: Chemical investigation on coriander seed oil.** *Bangaldesh Journal of Scientific and Industrial Research* 26(1-4): 1991: 33-40

GLC analysis of coriander seed oil showed presence of palmitic acid, petroselinic acid, oleic acid and linoleic acid as the major fatty acids. Lauric, myristic, myristoleic acid and palmitoleic acid were present in small amounts. TLC analysis of unsaponifiable matters showed presence of β-sitosterol. BV

Dills

216

Blank (I), Sen (A) and Grosch (W). **Sensory study on the character - impact flavour compounds of dill herb (*Anethum graveolens* L.).** *Food Chemistry* 43(5): 1992: 337-343

Extract from fresh dill herb showed the presence of (s)-α-phellandrene as the character-impact compound of dill flavour while the contribution of myristicin, methyl 2-methyl butanoate and (R)-limonene to dill flavour appeared less significant. SD

Marjoram

217

Tietz (U), Thomann (R) and Forstner (S). **High pressure extraction of marjoram. Part I. Sensory characterization of marjoram oleoresin by profile analysis.** *Die Nahrung* 35(10): 1991: 1013-1021 (De)

SENSORY EVALUATION

218

Tepper (BJ), Mattes (RD) and Farkas (BK). **Learned flavour cues influence food intake in humans.** *Journal of Sensory Studies* 6(2): 1991: 89-100

Subjects, 28 normal-wt. adults, were trained to associate distinctly flavoured high or low calorie lunches with their post ingestive effects. 25% of them adjusted their daily food intake based on their acquired sensory experience after initially misled by changes in the flavour cues and the remaining subjects were not misled but maintained their intake. Sensory cues may control long-term food intake of individuals. SD

219

Belford (AL), Lindsay (RC) and Ridley (SC). **Contributions of selected flavour compounds to the sensory properties of maple syrup.** *Journal of Sensory Studies* 6(2): 1991: 101-118

Volatile compounds, furnaeol, 2,5-dimethyl-4-hydroxy-3(2H)-furanone; sugar furanone,4,5-dimethyl-3-hydroxy-2(5H)-furanone; guaicol,2-methyoxy phenol; vanillin,4-hydroxy-3-methoxy-benzaldehyde were found to contribute to maple flavour intensity by a descriptive panel. Sugar furanone was exceptionally important determinant as 5'-inosine mono phosphate in maple syrup. Consumer preferred darker grade 4 syrups as more flavourable. SD

220

Buuren (S). **Analyzing time-intensity responses in sensory evaluation.** *Food Technology* 46(2): 1992: 101-104

Analysis of the time-intensity (TI) curves by the principal components which leads to the study of variation attributable to response patterns of judges is dealt in this article. The procedure involves the decomposing of TI curves into principal curves, variation in judges, analyzing principal curves and the contribution of individual curves. The results show that the variation caused by different judges overshadows the variability between products. CSA

221

Kemp (SE) and Birch (GG). **An intensity/time study of the taste of amino acids.** *Chemical Senses* 17(2): 1992: 151-168

Ten amino acids were assessed for sweetness, 11 for bitterness and 4 for both sweetness and bitterness. Limited relationships were found between chemical structure of the amino acids and their temporal properties. GS

222

Roy (G). **A review of sweet taste potentiation brought about by divalent oxygen and sulphur incorporation.** *CRC Critical Reviews in Food Science and Nutrition* 31(1/2): 1992: 59-77

Review. 129 references. SRA

FOOD STORAGE

Nil

INFESTATION CONTROL AND PESTICIDES

223

Dunaif (GE) and Krysinski (EP). **Managing the pesticide challenge: A food processor's model.** *Food Technology* 46(3): 1992: 72, 74-76

Approach that can be taken by the food industry to address the pesticide challenge using a number of methods integrated into a total systems approach to pesticide control is described. CSA

224

Miller (SA). **Novel foods: Safety and nutrition.** *Food Technology* 46(3): 1992: 114, 116-117

The fundamental analytical approach to the detn. of the wholesomeness of new and novel foods is discussed in this article. CSA

225

Caragay (AB). **Cancer-preventive foods and ingredients.** *Food Technology* 46(4): 1992: 65-68

The National Cancer Institute's five-year "designer foods" initiative which will provide new insights into the links between diet and cancer and firstly determine more precisely which foods and ingredients, alone and in combination offer significant cancer-preventive properties such as the role of phytochemicals present in common foods in preventing cancer in mankind and secondly to actually design foods with enhanced levels of those substances which may lead to the generation of entirely a new industry is discussed. CSA

226

Rajendran (S). **Selection for resistance to phosphine or methyl bromide in *Tribolium castaneum* (Coleoptera: Tenebrionidae).** *Bulletin of Entomological Research* 82(1): 1992: 119-124

The build-up resistance to phosphine and methyl bromide in the developmental stages of *Tribolium castaneum* (Herbst) after 6 selections in successive generation was investigated in the lab. at 25 plus or minus 1°C. Responses of the life stages of the fumigant-selected insects were compared with those of untreated controls with a 24 h exposure and mortality was assessed after 14 days. Phosphine induced the development of resistance irrespective of the life stage chosen for selection. The onset of phosphine resistance was noted after the first selection but the levels of resistance attained in the different stages varied depending on the stage tested, and in each case the degree of expression was different in the 4 stages of *T. castaneum*. After selection, phosphine resistance was highest in the pupae followed by eggs, adults and larvae. Resistance to methyl bromide in the methyl bromide treated insects increased only slightly (< x 2.0). Adults derived from egg, larva, pupa and adult selected methyl bromide lines showed cross-resistance to phosphine (x 1.8 to 11.5 at LD_{95}), while cross-resistance of adults to methyl bromide was noted only in adult-selected phosphine-resistant insects (x 1.5 at LD_{95}). AA

BIOCHEMISTRY AND NUTRITION

227

Krusen (F). **Alternative forms of nutrition in view of food-technological assessment.** *Ernahrungsforschung* 36(4): 1991: 116-121 (De)

Alternative forms of nutrition are based on agricultural products grown by use of alternative cultivation methods. Biological and ecological crop farming is actually desirable from the aspect of environmental burden and world nutrition. It particularly refers to the attempt to connect traditional ways with new approaches as it is fixed in the conception of "integrated plant cultivation". However, comparative studies on the quality of vegetable foods produced with both conventional or alternative methods did not indicate significant differences in the content of value-determining or value-lowering ingredients with significant impact on health which could be definitely proven by methods used in food chemistry. This does not apply to the nitrate content of alternative products which is remarkably lower as it has frequently been shown. AA

228

Petzke (KJ), Kozlovskaja (SG) and Grigorov (JG). **On the problem of nutrition and longevity: The role of energy intake and dietary fat.** *Ernahrungsforschung* 36(4): 1991: 122-125 (De)

Life span and the processes of aging may be influenced by practcal nutrition. This relation was especially clearly demonstrated in animal exp. using chronic food restriction resulting in a prolonged av. life span. The mechanisms for this effect remain to be elucidated. Some results suggest that a constrained adaptation of energy metabolism (economization) may be involved. The transfer of the results obtained with animals on human subjects is problematical by different reasons. Irrespective of this fact it will be advantageous to reduce energy consumption up to the requirement values considering an overnutrition in energy and fat of the av. western population. AA

229

Reichert (N) and Rubach (K). **Determination of biotin and folic acid in vitamin-containing foods by competitive binding protein assays (CBPA) and enzyme immunoassays (ELISA).** *Deutsche Lebensmittel-Rundschau* 87(11): 1991: 341-345 (De)

The paper describes the development and optimization of, in total, 5 different test procedures for the measurement of the vitamins, biotin and folic acid, based on CBPA and ELISA. Vitamin-Enzyme conjugates and a binding protein-enzyme conjugate were prepared for this purpose. Both naturally

occurring binding protein (avidin and streptavidin for biotin and the folate binding protein for folic acid) and commercially available antibodies were employed for the measurements, the tests developed were then compared with one another. Thus optimized, the assays were used to vitamin-containing foods and drinks, for example fruit juices, breakfast cereals, marmalade, or powdered drinks. AA

230

Notzold (H), Kretschmar (R) and Ludwig (E). **Contribution to the determination of protein hydrophobicity. Part 1. Determination of the hydrophobicity of selected cereal and milk proteins using their sodium dodecyl sulphate binding capacities.** *Die Nahrung* 35(9): 1991: 969-975 (De)

231

Notzold (H), Kretschmar (R) and Ludwig (E). **Contribution to the determination of protein hydrophobicity. Part 2. Determination of protein-bound sodium dodecyl sulphate using ultracentrifugation experiments.** *Die Nahrung* 35(9): 1991: 977-980 (De)

232

Anon. **How do foods affect folate bioavailability ?.** *Nutrition Reviews* 48(8): 1990: 326-328

The bioavailability of folates in foods varies: it is low for some foods that contain nutritionally important amounts of folate (e.g., legumes, orange juice, and tomatoes). Extracts of these foods significantly inhibited the activity of the intestinal enzyme that converts dietary polyglutamyl folates to the monoglutamyl form during absorption. AA

233

Gallaher (DD) and Schaubert (DR). **The effect of dietary fiber type on glycated hemoglobin and renal hypertrophy in the adult diabetic rat.** *Nutrition Research* 10(11): 1990: 1311-1323

The effect of various dietary fiber sources on glycated hemoglobin and renal hypertrophy, two long-term indicators of blood glucose control, was studied in diabetic rats. Streptozotocin-treated rats were fed a fiber-free diet or diets containing 8% dietary fiber, using one of the following fiber sources: cellulose, sugar beet fiber, beet fiber treated with calcium carbonate, oat bran, rye bran, barley bran flour, wheat bran, or guar gum. After 28 days, only guar gum-feeding reduced the % glycated hemoglobin relative to the fiber-free control group. Renal hypertrophy was seen in animals from all diabetic groups and was not diminished by any of the fiber sources. In meal-fed animals there was no evidence of expansion of the intestinal contents vol. by feeding of any fiber source. Guar gum substantially increased the viscosity of the intestinal contents in 3 of 4 animals. The results are consistent with the use of purified, highly viscous fiber sources for improving glycemic control in insulin-dependent diabetes. AA

234

Shinjo (S), Asato (L), Arakaki (S), Kina (T), Kohrin (T), Mori (M), Yamamoto (S). **Comparative effect of casein and soybean protein isolate on body fat accumulation in adult rats.** *Journal of Nutritional Science and Vitaminology* 38(3): 1992: 247-253

Adult rats (300 g wt.) were fed 21% protein (casein or soy protein isolate (SPI)) and 5% oil diets by pair-feeding for 65 days in exp. I; and protein (25%) and oil 10% in exp. II. Final body wt. of the 2 dietary groups were similar in both exp. Total body fat was slightly lower in the SPI diet group than in the casein diet group in exp. II. Intra abdominal fat (IAF) was significantly lower in the SPI diet groups than in the casein diet groups in both exp. Serum lipid levels were greatly lower in the SPI diet group than in the casein diet group in exp. II. The results suggest that dietary SPI has the effect to lower the IAF accumulation as compared with casein. BV

235

Horwitz (W), Albert (R), Deutsch (MJ) and Thompson (JN). **Precision parameters of methods of analysis required for nutrition labeling. Part II. Macro elements - calcium, magnesium, phosphorus, potassium, sodium and sulphur.** *Journal of AOAC International* 75(2): 1992: 227-239

236

Ulberth (F) and Reich (H). **Gas chromatographic determination of cholesterol in processeed foods.** *Food Chemistry* 43(5): 1992: 387-391

A precise and accurate GC method for the detn. of cholesterol in processed foods (sausages, mayonnaise, noodles, dressed fish sticks, Emmental cheese, dried soup and red cabbage meal), without prior total lipid extraction is described. The accuracy and precision of the method was assessed by using a BCR reference material (anhydrous butter fat). The method being comparable to enzymatic assay showed an analyte level of 267.8 plus or minus 1.78 mg for anhydrous butter fat and 59.1 plus or minus 2.46 for frankfurter sausages. SD

237

Tee (E-S). **Carotenoids and retionoids in human nutrition.** *CRC Critical Reviews in Food Science and Nutrition* 31(1/2); 1992; 103-163

This review covers a wide range of topics on 2 closely related compounds (carotenoids and retinoids). Emphasis is given to the functions of these compounds and their roles in human nutrition. Various aspects of vitamin A deficiency and studies on carotenoids and retinoids in cancer development and prevention are reviewed. 237 references. SRA

238

Boutton (TW), Lynott (MJ) and Bunsted (MP). **Stable carbon isotopes and the study of prehistoric diet.** *CRC Critical Reviews in Food Science and Nutrition* 30(4); 1991; 373-385

The use of carbon isotopes as a tool for investigating the introduction and relative importance of corn in the diet of prehistoric humans in the eastern part of North America is focused in this article. Aspects covered are: the basis of carbon isotope technique, description of study samples, sample preparation and mass spectrometric analysis, amino acid profiles of bone collagen, isotopic evidence for maize agriculture in Missouri/Arkansas, carbon isotope variation in an isochronous prehistoric human population, problems and limitations, and future prospects for stable isotopes in archaeology. 50 references. SRA

239

Turnlund (JR). **Bioavailability of dietary minerals to humans: The stable isotope approach.** *CRC Critical Reviews in Food Science and Nutrition* 30(4): 1991; 387-396

Minerals in foods are essential for humans, animals, and/or plants. The bioavailability of dietary minerals are considered to determine the diet contents. By using stable isotope (SI) tracers as labels, the metabolic fate of minerals in a specific day's diet, a specific meal, or a food can be distinguished from minerals from other sources and followed. A number of MS methods are used to measure SI. Magnetic sector, thermal ionization MS is used in the lab to study bioavailability of Zn, Cu and Fe. One of the major advantages of SI studies is that multiple isotopes of the same mineral can be used and multiple minerals can be studied simultaneously. The method can be used in food science and nutrition. 7 references. SRA

240

Pham (CB), Galvez (FCF) and Padolina (WG). **Methionine production by batch fermentation from various carbohydrates.** *ASEAN Food Journal* 7(1); 1992; 34-37

The fermentation conditions for microbial production of methionine using *Corynebacterium glutamicum* ATCC 21608 were optimized in shake flasks on a lab. scale with initial pH 7.0 at 30°C and 150 rev/min rotary rate. An inoculum age of 16 - 24 h and rate of 1% (v/v) were most favourable for methionine synthesis. A 20% vol. ratio (vol. of medium: vol. of flask) was optimum. Of the 4 sugar sources (sugarcane juice, molasses, banana and cassava) tested, molasses diluted by coconut water to give 250 g/l sugars proved optimum for methionine production, giving 3.6 g/l after 96 h of fermentation. Ammonium sulphate was the optimum N_2 source (2% w/v) for methionine production. SRA

TOXICOLOGY

241

Abbott (PJ). **Carcinogenic chemicals in food: Evaluating the health risk.** *Food and Chemical Toxicology* 30(4); 1992; 327-332

Reviews the synthetic chemicals in food present either as specific additive or as contaminants derived from environmental chemicals, which are potentially carcinogenic. The mechanisms by which mutagenic chemicals initiate cancer and the level of human exposure to these chemicals are reviewed in detail. GS

242

Abbott (PJ). **Carcinogenic chemicals in food: Evaluating the health risk.** *Food and Chemical Toxicology* 30(4); 1992; 327-332

The presence of a low level of potentially harmful chemicals (synthetic or natural) in food continuous to be a concern in many individuals. This paper reviews some of the issues in the light of recent developments in carcinogenic risk assessment with the aim of arriving at a balanced view of food safety, particularly with regard to carcinogenic risk. Aspects covered are: chemicals and human cancer, definition of term 'carcinogen', natural and synthetic carcinogens in food, natural defence system, current testing for carcinogenic chemicals, threshold dose level for carcinogens and identification of carcinogenic risk factors. 32 references. BV

243

Hall (RL). **Toxicological burdens and the shifting burden of toxicology.** *Food Technology* 46(3); 1992; 109-112

Natural toxicants, in the context of public health concerns and the safety of modified food sources are discussed. The relevance of natural toxicants to food, the harm it causes to humans, the methods employed to reduce the level of risks caused by the toxicants and the need to revise the means for evaluating food safety are dealt. CSA

244
Ellis (WO), Smith (JP), Simpson (BK) and Oldham (JH). **Aflatoxins in food: Occurrence, biosynthesis, effects on organisms, detection and methods of control.** *CRC Critical Reviews in Food Science and Nutrition* 30(4): 1991: 403-439

FOOD LAWS AND REGULATIONS

245
Crawford (LM). **International food safety regulations: Improving the Codex Alimentarius process.** *Food Technology* 46(2): 1992: 98, 100

Changes have been recommended for Codex Alimentarius process so that it can more effectively influence the international approaches to food regulation. CSA

246
Wehr (HM). **Pesticide residue regulations and the Pacific rim.** *Food Technology* 46(3): 1992: 77-79

Pesticide regulations that currently exist within the Pacific rim, (Japan, Taiwan and South Korea): discussions on some of the influences that exist within the Pacific rim: directions that Japan, Taiwan and South Korea are taking with respect to pesticide residue regulation: and strategies for reducing pesticide-related problems on exported food products are focussed in this article. CSA

247
Labuza (TP) and Baisier (W). **The role of the federal government in food safety.** *CRC Critical Reviews in Food Science and Nutrition* 31(3): 1992: 165-176

248
Hotchkiss (JH). **Pesticide residue controls to ensure food safety.** *CRC Critical Reviews in Food Science and Nutrition* 31(3): 1992: 191-203

The adequacy of controlling agricultural pesticides to minimize risks are critically reviewed in this article. Aspects covered are: risks from pesticides, role of the agrochemical industry, role of pesticide users and applicators, role of the food manufacturing and retail industries, role of government in regulating pesticides, criticisms, problems and reforms, and existing problems. 42 references. SRA

249
Pariza (MW). **Risk assessment.** *CRC Critical Reviews in Food Science and Nutrition* 31(3): 1992: 205-209

Describes the risk assessment process, some of the shortcomings, and the assurances of risk assessment applied to food safety evaluation, food safety priorities, evolution of risk, assessment in food safety, mechanics of risk assessment, uncertainity in risk assessment, interpreting risk assessments and future directions are highlighted in this article. 19 references. SRA

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